ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. LXXXVIII, No. 24 Thursday, June 13, 1929

Superintendents in Convention at Wausau

Representative Mill Men From All Over the Country and Canada Observe Tenth Anniversary of the American Pulp and Paper Mill Superintendents Association—Special Tribute Is Paid To Fred Boyce, First President and Presentations of Medals Are Made to Succeeding Heads of the Organization

[FROM OUR SPECIAL REPRESENTATIVE]

WAUSAU, Wis., June 10, 1929.—Favored with ideal weather conditions more than four hundred superintendents and their wives attended the tenth annual meeting of the American Pulp and Paper Mill Superintendents Association held here June 5-7. To feature the tenth anniversary of the association special tribute was paid to its founder, F. C. Boyce.

An address of welcome was delivered by D. C. Everest of the Marathon Paper Mills who outlined the evolution of conditions in the industry whereby friendly cooperation has to a marked degree supplanted the old time bitter jealousy that existed between mills. Mr. Everest also spoke of the wonderful backing given by the trade publications and the establishment of sound educational programs by the various organizations, in fact there was never a decade in which so many improvements have been made and so much advancement has taken place as in the last, the benefits extending to production and quality. He urged that efforts be made to develop new uses for paper and pulp to relieve the economic pressure of over production. "No superintendent of a paper mill should be an individualist," he said; "each one must work with and for the best interests of the industry."

Papers by Broughton and Thomas

"Common Sense Engineering," a paper by A. E. Broughton of Healy-Ruff Company of St. Paul, Minnesota, described the general methods by which steam is delivered to and handled in paper machine driers. E. G. Thomas, an engineer with the Toledo Scale Company of Toledo, Ohio, described the device manufactured by his company for continuously weighing the paper as it is made. Both of these papers as well as many others appear in the Technical Section of the PAPER TRADE JOURNAL this week.

Sectional Meetings

To meet the widespread interests of the men attending the meeting three divisional meetings were held on Thursday afternoon in the Elks Club. Victor E. Fishburn of the Burgess Laboratories presided over the meeting of the chemical and mechanical pulp division in which the following papers were read: "Control and Evaluation of Sulphite Pulp Quality," by Gosta P. Genberg of Fraser Companies, Ltd.; "Methods and Equipment for Wood Handling for Pulp and Paper Mills," by G. L. M. Helstrom of Montreal; "Economics of Burning Bark and Waste Wood," by H. A. Hatfield; "Scientific Control in a Ground Wood Mill," by W. H. Brydges of the Bedford Pulp and Paper Company; "Mechanical Pulp," by Levy A. Fralick of the Algonquin Paper Corporation; "Soda Pulp," by A. B. Larcher of the Penobscot Chemical Fibre Company; "Sulphate Pulp," by George Voght of the Wausau Sulphate Fibre Company.

In the fine paper divisional meeting James G. Ramsay was chairman, assisted by H. E. Stafford, H. W. Server and G. L. Bidwell. The following papers were presented: "The Making of Fine Papers," by Leon M. Yoerg of the American Writing Paper Company; "The Opacity of Paper," by H. Williamson of Champion Fibre Company; and the "Hill Tubular Agitator," by A. L. Whiteside of the Hill Clutch Company.

Kenneth T. King was chairman of the board and coarse papers session in which A. W. Wickham and R. W. Shaffer of MacAndrews & Forbes Company presented respectively the papers entitled "Rosin Sizing" and "The Buffer Process." C. C. Heritage of the Forest Products Laboratory gave an interesting talk on the subject "Strength Factors in the Manufacture of Board." In addition to the discussion of the papers read a number of minor questions were brought up and discussed by the members present.

Past Presidents Honored

In the beautifully decorated Rothschild Park Pavilion an excellent dinner was served for the members and their guests. From beginning to end there was action, entertainment, frivolity and seriousness. D. C. Everest, never before in better form, acted as toastmaster and introduced W. L. Edmonds of the Wausau Paper Mills who presented to the past presidents J. O'Connell, N. R. Davis, E. A. Coughlin, and Fred Rooney medals donated by F. C. Boyce, first president of the association. A similar medal was presented by members to Fred Boyce. Mr. Boyce was also presented with a watch by L. D. Post. The banquet was closed with an inspirational talk by Douglas Malloch, poet and author.

Following the banquet an outdoor pow wow of the local tribe of Indians was attended. During the tribal ceremonies in which the Indian rites were demonstrated Fred Boyce was made a full fledged member of the Winnebago tribe, entitled to all its privilegs and subject to all its penalties.

Friday's Meeting

Meeting again in the auditorium of the Elks Club the association under the chairmanship of President B. T. Larrabee, listened to the following papers: "The Economical Operation of Pulp and Paper Mills," by J. H. Slater of the Escanaba Paper Company; "The Advance of the Modern Paper Machine," by G. A. Machlem, of the Beloit Iron Works; "Perfect Pulp and Paper Mill Control," by F. C. Fildenzopf of the Congoleum-Nairn Company; "Slime Problem in Pulp and Paper Mills," by D. K. Pattillo of the National Aluminate Company; "Size and Alum Problems

Met in the Field," by C. E. Mueller of the Paper Makers Chemical Company.

Election of Officers

Fred C. Boyce, chairman of the nominating committee presented the following nominations of the committee, all candidates being then elected: President, James G. Ramsay, Jessup & Moore Paper Company; 1st Vice-President, Carl Magnus of the Standard Paper Manufacturing Company; 2nd Vice-President, Roy Kelley of Marathon Paper Mills Company; 3rd Vice-President, Wm. Brydges of the Bedford Pulp and Paper Company; 4th Vice-President, C. N. Mooney of the Smith Paper Company; 5th Vice-President, J. E. Blosser of the Scott Paper Company. Fred C. Boyce was elected trustee and R. I. Eminger, secretary-treasurer.

JAMES G. RAMSEY,
President

CARL MAGNUS,
1st Vice-President

by officers of the A. P. P. A. and TAPPI. The usual excellent professional entertainment featured the social side of the evening and dancing completed the day's program.

Saturday's Program

Allen Abrams of the Marathon Paper Mills presented a paper on "Technical Control of Pulp and Paper Mills" and R. Drake of the W. F. Hall Printing Company read a paper entitled "Jobbers' and Printing Problems Traced to the Paper Mill." Following the discussion of these two papers a general discussion of a large number of questions followed.

Exhibits

An interesting group of exhibits were featured in the Hotel Wausau. The exhibiting companies included Cameron Machine Company of Brooklyn, N. Y., slitters and winders; the Economy Engineering Company of Chicago, stackers for rolls and boxes; Western Iron Stores, Milwaukee, Wis., paper mill supplies; Link Belt Company, gears and chains; Joseph J. Plank Company, dandy rolls; Ludlum Steel Company, alloys; Kalamazoo Tank & Silo Company, tile tanks; Buffalo Foundry & Machine Company, evaporators; Better Packages, Inc., Shelton, Conn., packages; Michigan Pipe Company, pipe; Merritt Engineering & Sales Com-

R. H. KELLY,
2nd Vice-President

WM. H. BRYDGES,
3rd Vice-President

CHAS. M. MOONEY,
4th Vice-President

Mill Visits

All of the local mills extended a friendly invitation to the delegates to visit them on Friday afternoon. These mills included the Marathon Paper Mills Company, Wausau Paper Mills, D. J. Murray Manufacturing Company, Mosinee Paper Mills Company, and others that were more remote from Wausau.

An enjoyable banquet was held in the Elks Club in the evening at which F. C. Boyce acted as toastmaster. Brief talks were given

pany, Lockport, N. Y., agitator and stock regulator; Richards-Wilcox Company, Aurora, Ill., conveying equipment; Fulton Engineering Company, Middletown, Ohio, drying system; Wisconsin Vocational Schools, the U. S. Forest Products Laboratory of Madison, Wis.; Wrigle Agency, Kalamazoo, Mich., roll pulp; and Gilbert & Nash Company, Inc., Menasha, Wis., felt guides, etc.

Committees

Much credit is due to the convention committees for their excellence in planning and carrying out through the details of the meeting. Roy Kelly as general chairman bore the principle responsibility and was ably assisted by the following committees: Finance—P. M. Wilson, Norman S. Stone, T. L. Edmonds; Entertainment—E. M. Bassler, H. A. Skinner, N. H. Foley; Transportation and Mill Visits—Grover Veeth, George Urbana, W. E. Payne; Program and Arrangements—F. L. Zellers, V. Atherton, George Voght; Registration—Allan Abrams, W. R. Winn, Judson Smith; Ladies and Entertainment—Mrs. D. C. Everest, Mrs. R. H. Kelly, Mrs. Grover Veeth, R. M. Altman, and C. H. Noble. The convention secretary was Wallace Shybanski.

J. E. BLOSSER,
5th Vice-President

ROBERT L. EMINGER,
Secretary-Treasurer

FRED C. BOYCE,
Board of Trustees

NELSON R. DAVIS,
Board of Trustees

FRED J. ROONEY,
Board of Trustees

Among Those Who Attended

Mr. and Mrs. Allen Abrams, Marathon Paper Mills Co., Rothschild, Wis.
Armand J. Abrams, Bogalusa Paper Co., Bogalusa, La.
Mr. and Mrs. A. W. Agrell, Patten Paper Co., Kaukauna, Wis.
Emoran Ahles, Mosinee Paper Mills Co., Mosinee, Wis.
Mr. and Mrs. A. J. Allison, Miami Div., Dayton, Ohio.
Robert M. Altman, Marathon Paper Mills Co., Wausau, Wis.
Oscar E. Anderson, M. & M. Paper Co., Marinette, Wis.
Mr. and Mrs. C. K. Andrews, Blandin Paper Co., Grand Rapids, Wis.
H. G. Andrews, Shartle Bros., Middletown, Ohio.
James J. Andrews, Fox Paper Co., Lockland, Ohio.
Mr. and Mrs. Michael J. Argy, Cliff Paper Co., Niagara Falls.
Mr. and Mrs. Wm. J. Argy, Marmon Paper Co., Brownville, N. Y.
Mr. and Mrs. Wm. P. Argy, Argy Pre-Heating Co., Niagara Falls, N. Y.
L. B. Armstrong, Hewitt-Gutta Percha Rubber Corp., Chicago.
E. W. Artz, Better Packages, Inc., Milwaukee, Wis.
N. Atherton, Wisconsin River Supply Co., Wausau, Wis.
Miss Nellie Auvil, Middletown, Ohio.
Mr. and Mrs. Ross Auvil, Crystal Paper Co., Middletown, Ohio.
John A. Adams, Whiting Plover Paper Co., Stevens Point, Wis.
J. A. Babcock, The Wis. River P. & P. Co., Neenah, Wis.

PICTURE OF THE MEMBERS AND GUESTS AT THE ANNUAL CONVENTION OF THE AM

C. M. Baker, A. P. P. A., Madison, Wis.
R. R. Baker, Westinghouse Elect. & Mfg. Co., Pittsburgh, Pa.
Frank Bell, Man. Rubber Co., Passaic, N. J.
Thos. J. Bannister, Standard Paper Mfg. Co., Richmond, Va.
M. D. Bardean, Tee Paper Co., Vicksburg, Mich.
Marshall L. Barker, Beckett Paper Co., Hamilton, Ohio.
A. H. Barlow, Hagar Show Board & Paper Co., Cedarville, Ohio.
F. L. Barstow, U. S. Rubber Co., Fitchburg, Mass.
Mr. and Mrs. E. M. Bassler, D. J. Murry Mfg. Co.
Mr. and Mrs. E. N. Bechard, Eastwood Wire Corp., Belleville, N. J.
J. B. Bedore, Escanaba Paper Co., Escanaba, Mich.
Bernard Benson, Williams Gray Co., Chicago, Ill.
Henry Bert, Monroe Paper Products Co., Monroe, Mich.
Mr. and Mrs. Geo. L. Bidwell, Warren Mfg. Co., Riegelsville, Pa.
Harold O. H. Bing, The Paper & Textile Mach. Co., Sandusky, Ohio.
Mr. and Mrs. B. M. Bishop, Terre Haute Paper Co., Terre Haute, Ind.
Thos. N. Bishop, Pittsburgh Piping & Equipment Co., Chicago.
H. M. Blandin, Cornell Wood Products Co., Cornell, Wis.
George J. Blanton, Chain Belt Co., Milwaukee, Wis.
Mr. and Mrs. J. E. Blosser, Scott Paper Co., Chester, Pa.
Robert M. Boehm, Celotex, Chicago, Ill.
Mr. and Mrs. Geo. A. Bogle, Cherry Burrell, Tama, Ia.
Warren Bogle, Tama, Iowa.
Geo. Bonner, Falls Mfg. Co., Oconto Falls, Wis.
Hugo Boldt, Falls Mfg. Co., Oconto Falls, Wis.
P. J. Borenz, Marathon Paper Mills, Menasha, Wis.
Mr. and Mrs. F. C. Boyce, Wausau Paper Mills Co., Wausau, Wis.
Miss Gertrude Boyce, Wausau, Wis.
P. D. Bradley, Fort Howard Paper Co., Green Bay, Wis.
A. T. Brainerd, Ciba Co., Chicago, Ill.
C. A. Brattstrom, Chas. Stevens & Co., Chicago, Ill.
E. D. Brauns, Duriron Co., Dayton, Ohio.
G. S. Brazeau, Appleton Machine Co., Appleton, Wis.
Mr. and Mrs. L. H. Breyfogle, Druper Bros. Co., Kalamazoo, Mich.
Adam E. Bridge, Shartle Bridge, Middletown, Ohio.
Berford Brittain, Pittsburgh Piping & Equipment Co., Chicago.
H. L. Brooks, Provincial Paper, Mille Rochis, Ont.
C. J. Brooks, National Adhesives Corp., New York, N. Y.
Mr. and Mrs. A. E. Broughton, Healy Ruff Co., Minneapolis, Minn.
Wm. E. Brown, Woonsocket, R. I.
Homer F. Brundage, The Brundage Co., Kalamazoo, Mich.
Mr. and Mrs. W. H. Brydges, Bedford Pulp and Paper Co., Big Island, Va.
William E. Buchanan, Appleton Wire Works, Inc., Appleton, Wis.
Mr. and Mrs. S. B. Briggs, Tomahawk Kraft Paper Co., Tomahawk, Wis.
Mr. and Mrs. J. Howard Burke, Glassine Co., W. Conshohocken, Pa.
W. H. Burns, Valley Iron Works Co., Appleton, Wis.
C. A. Burrows, Munsing Paper Co., Munsing, Mich.
O. W. Callighan, Edgar Bros. Co., New York, N. Y.
F. J. Carroll, Simonds Saw & Steel Co., Chicago.
P. A. Carlson, SKF Industries, Chicago.
Alex. G. Center, Stowe & Woodward Co., Newton Upper Falls, Mass.

GROUP PICTURE TAKEN OF THE LADY GUESTS AT THE ANNUAL CONVENTION OF THE AM

AND PAPER MILL SUPERINTENDENTS ASSOCIATION, WAUSAU, WIS., JUNE 6-8, 1929

Charles Champion, Miller Falls Paper Co., Miller Falls, Mass.
C. J. Christiansen, Fibre Making Processes, Chicago.
Mrs. C. J. Christiansen, Chicago.
Edw. J. Clark, Cornell Wood Prod., Cornell, Wis.
A. B. Clark, J. O. Ross Engr. Corp., New York, N. Y.
W. A. Cocke, Shartle Bros. Mch. Co., Middletown, Ohio.
A. W. Cole, Rex Paper Co., Kalamazoo, Mich.
Warde C. Cookman, Philadelphia Quartz Co., Chicago.
M. H. Coombs, Kalamazoo Tank & Silo Co., Kalamazoo, Mich.
John Cornell, The Paper Mill, New York, N. Y.
S. V. Cottreall, Nat. Aniline & Chemical Co., Chicago.
J. M. Cram, Security Rubber & Belting Co., Chicago.
Mr. and Mrs. W. A. Crawford, Sutherland Paper Co., Kalamazoo, Mich.
Mr. and Mrs. Geo. F. Cropsey, Stebbins Engr. & Mfg. Co., Watertown, N. Y.
R. J. Cunningham, Northern Paper Mills, Green Bay, Wis.
W. H. Cunningham, Mead Pulp & Paper Co., Dayton, Ohio.
John E. Daley, Port Huron Sulphite & Paper Co., Port Huron, Mich.
W. C. Daley, Port Huron Sulphite & Paper Co., Port Huron, Mich.
Charles Davidson, Jr., Southworth Paper Co., West Springfield, Mass.
C. Dawley, National Paper Products Co., Carthage, N. Y.
Mr. and Mrs. Harry W. Deffew, Standard Paper Mfg. Co., Richmond, Va.
John Deltgen, Appleton Coated Paper Co., Appleton, Wis.
V. S. Denison, Paper & Textile Mchry. Co., Sandusky, Ohio.
R. H. Dines, National Aluminate Corp., Chicago.
Mr. and Mrs. W. J. Dolan, Rhinelander, Wis.
D. A. Donnelly, Moore & White Co., Philadelphia, Pa.
L. M. Doty, Escanaba Paper Co., Escanaba, Mich.
Joseph H. Dow, Eastwood Wire Corp., Belleville, N. J.
Lewis Dozier, Rhinelander Paper Co., Rhinelander, Wis.
Ronald I. Drake, W. F. Hall Pkg. Co., Chicago.
Richard F. Driscold, Smith Paper Co., Lee, Mass.
Jerry Duggan, Fort Howard Paper Co., Green Bay, Wis.
T. L. Dunbar, Chemipulp & Process, Inc., Watertown, N. Y.
Mr. and Mrs. Chas. J. Dupins, Great Western Paper Co., Ladysmith, Wis.
Mr. and Mrs. Clarence LeRoy Durkee, D. J. Murray Mfg. Co., Wausau, Wis.
Thorpe Edmonds, Wausau Paper Mills Co., Brokaw, Wis.
Vance Edwards, Forest Products Lab., Madison, Wis.
R. J. Egan, Bulkley, Dunton & Co., New York, N. Y.
Frank B. Eilers, Kalamazoo, Mich.
Mr. and Mrs. Charles L. Ellis, Downingtown Mfg. Co., Downingtown, Pa.
Robert L. Eminger, National Secy-Treas., Miamisburg, Ohio.
Mrs. Robert L. Eminger, Miamisburg, Ohio.
D. C. Everest, Wausau, Wis.
Mrs. D. C. Everest, Wausau, Wis.
L. H. Everlien, U. S. Rubber Co., Appleton, Wis.
Frgd. Fairbrother, Munising Paper Co., Munising, Mich.
E. G. Farnsworth, Farnsworth Co., Conshohocken, Pa.
Clarence A. Fee, Simonds Saw & Steel Co., Chicago.
C. B. Fieldhouse, Ciba Co., Chicago.
Mr. and Mrs. Fred. H. Fielding, Diamond Mills Paper, Bloomfield, N. J.
Victor E. Fishburn, Burgess Laboratories, Freeport, Ill.
W. W. Fitzgerald, Northern Paper Mills, Green Bay, Wis.

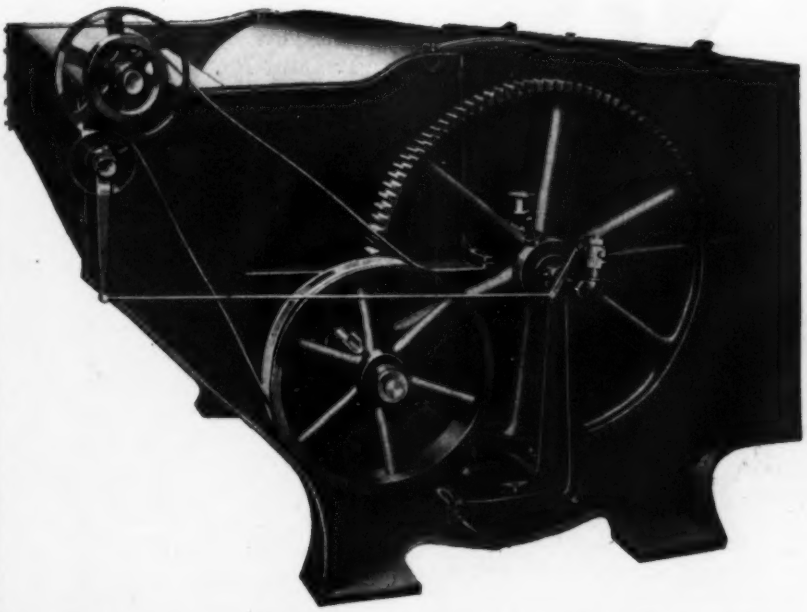
AND PAPER MILL SUPERINTENDENTS ASSOCIATION, WAUSAU, WIS., JUNE 6-8, 1929

Mike Foley, N. W. Paper Co., Cloquet, Minn.
A. W. Foley, Hummel-Ross Fibre Co., Hopewell, Va.
Norman H. Foley, Marathon Paper Mills, Rothschild, Wis.
Mr. and Mrs. Paul Fortier, Michigan Paper Co., Plainwell, Mich.
Samuel J. Fortune, Rochester Paper Co., Rochester, Mich.
Mr. and Mrs. Gilbert R. Fostei, Western Bd. Pa. Co., Kalamazoo, Mich.
James A. Foxgrover, Paper Makers Chemical Corp., Kalamazoo, Mich.
L. A. Fralick, Algonquin Paper Co., Ogdensburg, N. Y.
Herebt F. Freas, Spaulding Fibre Co., Inc., Tonawanda, N. Y.
E. J. Fringeline, Morristown, Pa.
H. D. Frost, The W. S. Tyler Co., Cleveland, Ohio.
F. F. Frothingham, Bird Machine Co., South Walpole, Mass.
Wm. B. Fulton, Fulton Eng. Co., Inc., Middletown, Ohio.
Wilson W. Galloway, Hagar Show Board & Paper Co., Cedarville, Ohio.
C. R. Gibbs, The Bagley & Sewall Co., Watertown, N. Y.
E. C. Gildengoff, Congoleum Nairn, Inc., Asbesto, Md.
E. H. Gilman, Watervliet, Mich.
Gus Gilsoul, Fort Howard Paper Co., Green Bay, Wis.
Mr. and Mrs. Arthur F. Girard, Great Western Paper Co., Ladysmith, Wis.
Walter Glass, B. F. Goodrich Rubber Co., Akron, Ohio.
P. H. Glatfelter, P. H. Glatfelter Co., Spring Grove, Pa.
Mr. and Mrs. E. P. Gleason, Nekoosa Edwards Paper Co., Port Edwards, Wis.
H. W. Gechnner, Northern Paper Mills, Green Bay, Wis.
Otto J. Goeppinger, Waterbury Tool Co., Waterbury, Conn.
Miss Anna Green, Kalamazoo, Mich.
L. L. Griffiths, Jr., Electro Bleaching Gas Co., New York, N. Y.
H. J. Grossman, Sherman Corp., Chicago, Ill.
W. H. Gindotti, Leavens Gindotti, Neenah, Wis.
John S. Gulledge, B. F. Goodrich Rubber Co., Akron, Ohio.
A. Gustin, Falls Mfg. Co., Oconto Falls, Wis.
Robert M. Guie, Philadelphia Felt Co., Frankford, Pa.
W. A. Gocke, Shartle Brothers Mach. Co., Middletown, Ohio.
J. P. Hagenaner, L. V. Ester, Inc., Chicago.
Jesse E. Hamilton, Combined Locks Paper Co., Combined Locks, Wis.
A. B. Hensen, Marinette & Menominee Paper Co., Marinette, Wis.
J. L. Harding, Thuler & Benninghofer, Hamilton, Ohio.
W. A. Harvey, Enterprise Machine Co., Middletown, Ohio.
Mr. and Mrs. M. H. Haskins, Hobey Paper & Fibre, Green Bay, Wis.
James L. Hayes, Bemis Bros. Bag Co., Peoria, Ill.
Jan Haugerod, Peshtigo, Wis.
Mrs. Violet Y. Hawkins, Howard Paper Co., Urbana, Ohio.
O. A. Haynes, Anchor Packing Co., Chicago, Ill.
James L. Hayes, Peoria, Ill.
G. L. M. Hellstrom, Paper Machinery Limited, Montreal, Can.
Clara C. Heritage, Forest Products Laboratory, Madison, Wis.
G. A. Hermann, Hermann Mfg., Co., Lancaster, Ohio.
J. A. Hewitt, Hewitt Machine Co., Neenah, Wis.
Mr. and Mrs. A. M. Hinkson, Niagara Falls Products Co., Niagara Falls, N. Y.
Mr. and Mrs. A. G. Hinzke, Provincial Paper, Ltd., Port Arthur, Ont.
Walter E. Hinzke, Provincial Paper Mills, Port Arthur, Ont.
W. W. Hinnenthal, Marinette & Menominee Paper Co., Marinette, Wis.
Walter S. Hodges, Appleton Wire Works, Inc., Portland, Ore.
A. J. Hofherr, M. & M. Paper Co., Marinette, Wis.
Wm. Hokenson, M. & M. Paper Co., Marinette, Wis.
Roy Holden, D. P. Brown & Co., Philadelphia, Pa.
C. M. Holt, Perena Salt Mfg. Co., Philadelphia, Pa.
A. F. Horton, National Aluminate Corp., Chicago.
H. R. Heuer, Newton Falls Paper Co., Newton Falls, N. Y.
Ralph Hoover, Chas. N. Stevens Co., Chicago.
Mathew V. Horgan, Am. Writing Paper Co., Holyoke, Mass.
H. D. Horton, Simonds Saw & Steel Co., Boston, Mass.
L. C. Howard, Marathon Paper Co., Wausau, Wis.
Mrs. L. C. Howard, Wausau, Wis.
W. C. Hurley, Waterbury & Sons Co., Oriskany, N. Y.
Allan Hyer, Black Clawson Co., Hamilton, Ohio.
R. W. Haddock, Escanaba Paper Co., Escanaba, Mich.
Mr. and Mrs. Thos. H. Ireland, Crane Co., New York, N. Y.
R. H. Irwin, Yale & Towne Mfg. Co., Chicago.
J. H. Jackson, The W. S. Tyler Co., Chicago.
Mr. and Mrs. E. C. Jacobi, Standard Oil Co., Green Bay, Wis.
Lawrence H. Jacobson, Jacobson Engineering Co., Minneapolis, Minn.
Harry Jacquin, Fort Howard Paper Co., Green Bay, Wis.
Mr. and Mrs. Jerome Janecek, Cherry River, Rickwood, W. Va.
G. C. Johnson, Quaker City Rubber Co., Chicago.
Mr. and Mrs. Peter C. Jones, Patten Paper Co., Appleton, Wis.
Mr. and Mrs. H. Joseph, Marathon Paper Mills Co., Ashland, Wis.
Paul Joslin, Flambeau Paper Co., Park Falls, Wis.
Brown Katzenback, Masonette Corp., Laurel, Miss.
Max Kavanagh, The Manhattan Rubber Mfg. Co., Passaic, N. J.
Mr. and Mrs. Grover Keeth, M. P. M. Co., Wausau, Wis.
R. S. Kellogg, News Print Service Bureau, New York, N. Y.
Mr. and Mrs. D. M. Kelly, Bloomer Bros. Co., Newark, N. Y.
Mr. and Mrs. R. Kelly, Marathon Paper Mills Co., Rothschild, Wis.
W. A. Kelly, Northern Paper Mills, Green Bay, Wis.
W. H. Kenety, N. M. Paper Co., Cloquet, Minn.
A. J. Kennedy, The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.
C. H. Kephart, York Haven Paper Co., York Haven, Pa.
E. S. Kerbey, Midwest Piping & Supply Co., Chicago.
Martin L. Keimer, Buffalo Foundry & Mach., Buffalo, N. Y.
Mr. and Mrs. C. J. Kerr, Moore & White Co., Philadelphia, Pa.
F. E. Kerr, United Paperboard Co., Peoria, Ill.
Mr. and Mrs. M. J. Ketter, Hoberg Paper & Fibre Co., Green Bay, Wis.
W. S. Kidd, E. B. Eddy Co., Hull, Can.
Irving G. King, Barrett-Cravens Co., Chicago.
Kenneth T. King, Du Pont Co., Chicago.
G. A. Koebke, Manitowoc Engineering Works, Manitowoc, Wis.
Edward Kormin, Heller & Merz Co., Chicago.
Robert Knowles, Reading Paper Mills, Reading, Pa.
Fred. Krankold, Kimberly Clark Corp., Neenah, Wis.
Mr. and Mrs. Wm. H. Kraske, Wisconsin Rapids, Wis.
Clarence W. Krueger, Western Iron Stores Co., Milwaukee, Wis.
P. J. Kummer, Tomahawk P. & P. Co., Tomahawk, Wis.
Jacob Kuss, Mich. Paper, Kalamazoo, Mich.
Warren J. Landfare, Appleton Wire Works, Appleton, Wis.
Benjamin T. Larrabee, S. D. Warren & Co., Cumberland Mills, Maine.
Margaret C. Larrabee, Cumberland Mills, Maine.
L. H. Larsen, Kalbfleisch Corp., Kalamazoo, Mich.
Homer H. Latimer, Beckett Paper Co., Hamilton, Ohio.
H. P. Leftwich, Wadhams Oil Co., Milwaukee, Wis.
John Lehner, Hoberg Fibre Co., Green Bay, Wis.
Elmer Lenz, Hoberg Paper Fibre Co., Green Bay, Wis.
Mr. and Mrs. O. L. LeRoux, Hennepin Paper Co., Little Falls, Minn.
Ralph Lewis, Wm. L. Barrell Co., Boston, Mass.
Arthur J. Loman, Robert Gair Co., New London, Conn.
Chas. Ludington, E. B. Eddy Co., Hull, Can.
C. E. Lyon, Hooker Electro Chemical Co., Niagara Falls, N. Y.
Mr. and Mrs. Peter J. Massey, Seaman Paper Co., Chicago.

Everything you want in a Save-All plus extreme simplicity of construction, operation and maintenance.

That is why you get lowest cost per pound of fibre recovered with —

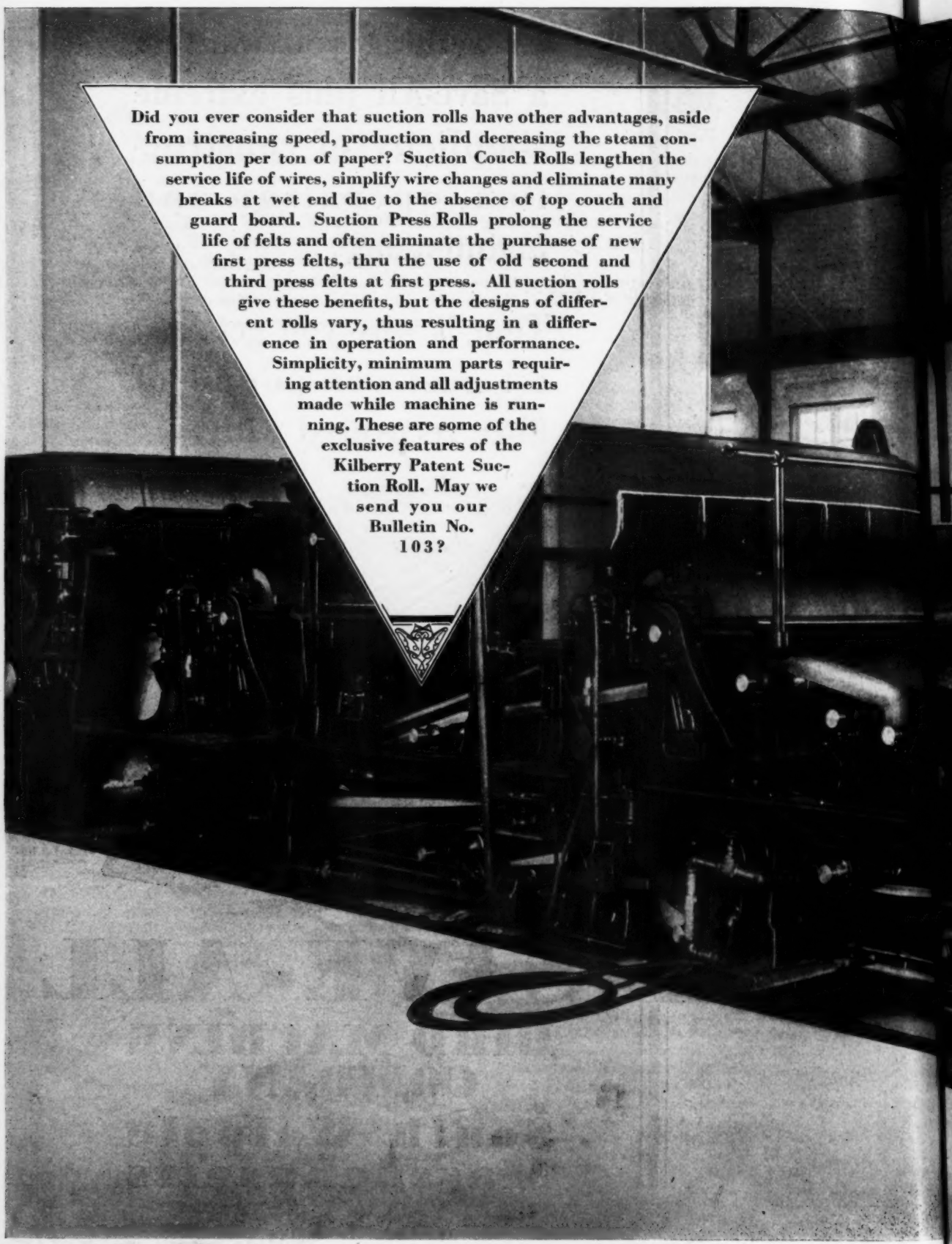
BIRD MACHINERY

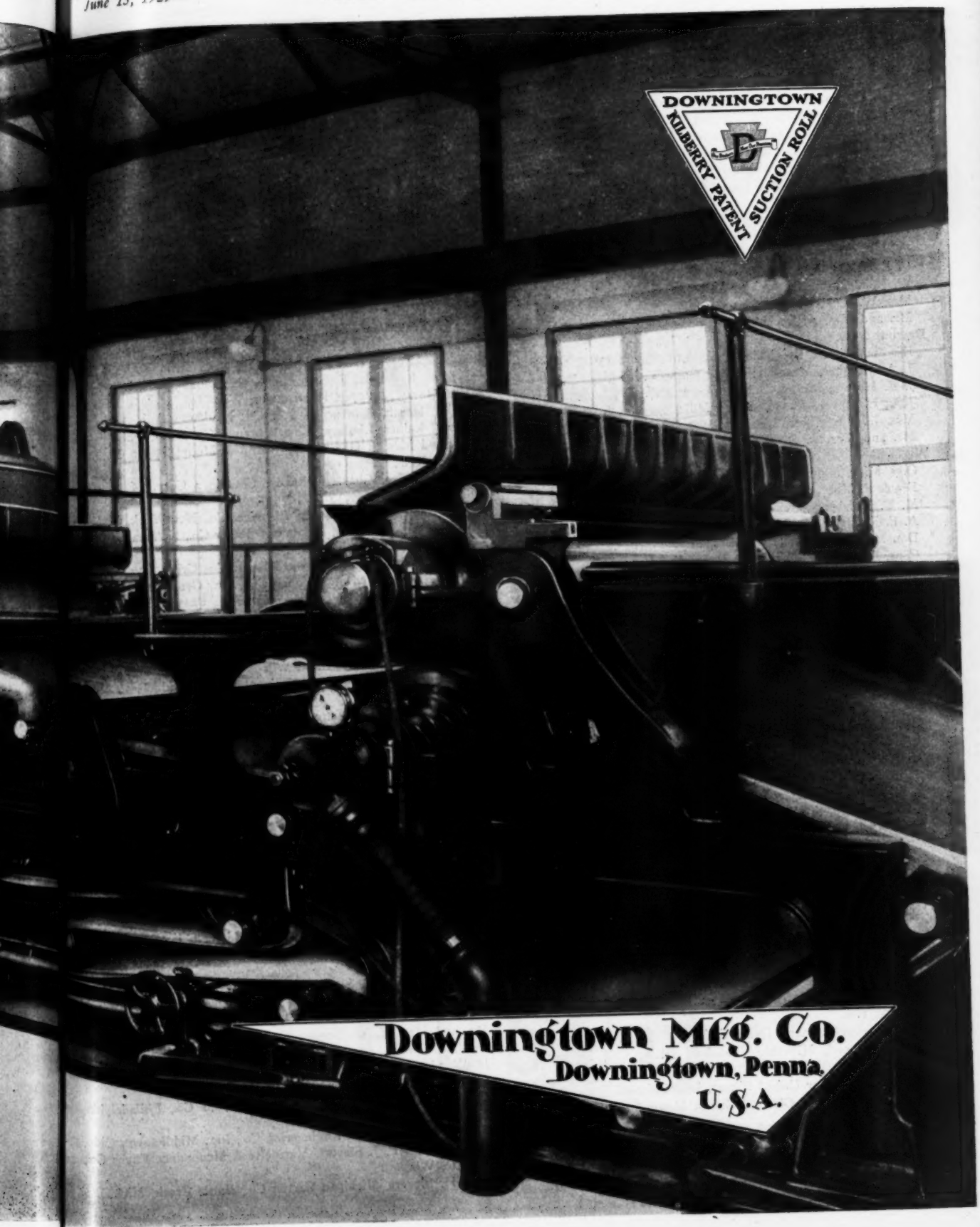


Recommended for use in our new system of white water treatment. Do you know about this remarkable system? Let us send you the facts.

THE BIRD SAVE-ALL

BIRD MACHINE COMPANY
South Walpole
Massachusetts


Did you ever consider that suction rolls have other advantages, aside from increasing speed, production and decreasing the steam consumption per ton of paper? Suction Couch Rolls lengthen the service life of wires, simplify wire changes and eliminate many breaks at wet end due to the absence of top couch and guard board. Suction Press Rolls prolong the service life of felts and often eliminate the purchase of new first press felts, thru the use of old second and third press felts at first press. All suction rolls give these benefits, but the designs of different rolls vary, thus resulting in a difference in operation and performance. Simplicity, minimum parts requiring attention and all adjustments made while machine is running. These are some of the exclusive features of the Kilberry Patent Suction Roll. May we send you our Bulletin No. 103?


DOWNINGTOWN
KILBERRY PATENT SUCTION ROLL
Downingtown Mfg. Co.
Downingtown, Penna.
U. S. A.

H. C. Macaulay, Continental Paper & Bag Co., Rumford, Maine.
Ronald G. Macdonald, Technical Assn. Pulp & Paper Ind., New York, N. Y.
Frank H. Machell, U. S. Rubber Co., Milwaukee, Wis.
W. Macklen, Black Clawson, Hamilton, Ohio.
E. R. MacLaren, Albany Felt Co., Albany, N. Y.
R. B. Martin, Wallace & Tiernan Co., Inc., Newark, N. J.
G. S. Oscar Matthai, The Heller & Merz Co., Chicago.
George J. Maye, Appleton Wire Works, Appleton, Wis.
Edw. R. McCornock, Central Wire Cloth Co., Green Bay, Wis.
Mr. and Mrs. E. J. McDonnell, Groveton Paper Co., Groveton, N. H.
C. N. Duffee, Claremont, N. H.
Louise McGrath, Booth Chemical Co., Elizabeth, N. J.
W. McGraw, Hewitt-Gutta Percha Rubber Corp., Jackson, Mich.
C. J. McMahon, Mill Supplies, Kalamazoo, Mich.
W. K. McNair, Northwest Paper Co., Cloquet, Minn.
Mrs. W. R. McPherson, Otsego, Mich.
Mr. and Mrs. Arthur McPhillips, Simonds Worden White Co., Dayton, Ohio.
Ed. McWhirter, Provincial Paper Ltd., Georgetown, Ont., Can.
J. A. Meagher, Marathon Paper Mills Co.
J. E. Meyers, Merritt Engineering & Lab. Co., Lockport, N. Y.
John L. Meyer, Badger Paper Mills, Inc., Peshtigo, Wis.
Mrs. John J. Meyer, Menasha, Wis.
Mr. and Mrs. R. L. Michel, Wolf River Paper Co., Shawano, Wis.
O. J. Mills, Sandy Hill Iron & Brass Wks., Hudson Falls, N. Y.
Frank F. Mohr, Johns-Manville Corp., Milwaukee, Wis.
M. V. Molsberry, General Electric Co., Milwaukee, Wis.
A. E. Montgomery, J. O. Ross Engineering Corp., Chicago.
Don Montville, Shartle Brothers, Middletown, Ohio.
Chas. N. Mooney, The Smith Paper Co., Lee, Mass.
A. J. Monro, Official Reporter, Buffalo, N. Y.
Mr. and Mrs. H. A. Morrison, Oliver United Filters, New York, N. Y.
Jos. A. Moses, Faleilah Paper Co., Fitchburg, Mass.
Fred. Motschman, Continental Paper & Bag Corp., Rumford, Maine.
Charles E. Mueller, Paper Makers Chem. Corp., Kalamazoo, Mich.
Mr. Mulchaey, Park Falls, Wis.
Mrs. E. J. Mulchaey, Grandfather Falls, Merrill, Wis.
J. J. Mulchaey, Flambeau Paper Co., Park Falls, Wis.
Miss Betty Mulchaey, Grandfather Falls, Merrill, Wis.
E. J. Mulchaey, Grandfather Falls, Merrill, Wis.
F. S. Murphy, Lockport Felt Co., Appleton, Wis.
J. M. Murphey, Solvay Sales Corp., Chicago.
K. C. Nash, Lake View Paper Co., Neenah, Wis.
Mr. and Mrs. Wm. C. Nash, Gilbert & Nash, Menasha, Wis.
Julius Nelson, Munising Paper Co., Munising, Mich.
Mr. and Mrs. G. Nicholson, Bogalusa Paper Co., Bogalusa, La.
H. G. Noyes, Wis. Vocational Schools, Appleton, Wis.
Mrs. Joe Niks, Chillicothe, Ohio.
Mr. and Mrs. N. J. Niks, Chillicothe Paper Co., Chillicothe, Ohio.
Mr. and Mrs. Otto Noble, Kalamazoo, Mich.
C. H. North, Green Bay Tch. & Mch. Works, Green Bay, Wis.
Mr. and Mrs. N. A. North, Green Bay Tch. & Mch. Works, Green Bay, Wis.
John J. Nyland, General Dyestuff Corp., Chicago.
J. E. O'Donnell, Milwaukee Leather Belting Co., Milwaukee, Wis.
C. B. Oliver, Oliver United Filters, Inc., Chicago.
Mr. and Mrs. J. W. Olson, Nekoosa Motor & Mach. Co., Nekoosa, Wis.
J. F. O'Toole, International Wire Works, Menasha, Wis.
Jacob Parent, The Noble & Wood Mach. Co., Hoosick Falls, N. Y.
Mrs. J. Parent, Kalamazoo, Mich.
Mr. and Mrs. Edward L. Parsons, Foote Bros. Gear & Mach. Co., Milwaukee, Wis.
Donald K. Patillo, National Aluminate Corp., Chicago.
Louis Pauls, Marathon Paper Mills, Rothschild, Wis.
Peter A. Paulson, Kimberly Clark Corp., Neenah, Wis.
E. E. Payne, Record Herald, Wausau, Wis.
W. E. Payne, M. P. M. Co., Rothschild, Wis.
M. B. Peacock, M. & M. Paper Mills, Marinette, Wis.
S. M. Perrig, E. C. Atkins & Co., Indianapolis, Ind.
A. W. Pesch, Falls Man. Co., Oconto Falls, Wis.
G. Peterson, Cheney Bigelow Wire Works, Springfield, Mass.
W. E. Phillips, Mathieson Alkali Works, Chicago, Ill.
Mr. and Mrs. Albert Piepenburg, Combined Locks Paper Co., Combined Locks, Wis.
Miss Thelma Pierce, Kalamazoo, Mich.
C. M. Pinchon, Quaker City Rubber Co., Chicago, Ill.
O. M. Porter, Am. Paper & Pulp Ass., New York, N. Y.
L. D. Post, Paper Mill, New York, N. Y.
Geo. H. Pountain, Bryant Paper Co., Kalamazoo, Mich.
Max V. Poyck, Helley & Merz Co., New York, N. Y.
Wm. E. Rollinson, E. C. Atkins & Co., Indianapolis, Ind.
Mrs. Harry L. Reeve, Rhinelander, Wis.
R. M. Radsch, Milmany P. & P. Co., Kaukauna, Wis.
J. W. Raines, Lindsay Wire Weaving, Cleveland, Ohio.
Mr. and Mrs. J. G. Ramsey, Jessup & Moore Paper Co., Wilmington, Del.
Mr. and Mrs. Chas. E. Raney, Container Corp. of America, Chicago.
G. F. Reale, Hooker Electro-Chemical Co., New York, N. Y.
Michael Ed. Redmond, Kalamazoo Paper Co., Kalamazoo, Mich.
Harry L. Reevs, Rhinelander, Wis.
Leon Reidenbach, Fort Howard Paper Co., Green Bay, Wis.
H. C. Reimer, Groveton Paper Co., Inc., Groveton, N. H.
Fuzzy Reynolds, R. and J. Dick Co., Inc., Passaic, N. J.
Mr. and Mrs. A. F. Richter, Stebbins Engr. & Mfg. Co., Watertown, N. Y.
A. M. Riedel, Gus Riedel & Son, Kalamazoo, Mich.
C. Reimenschneider, Richard Wilcox Mfg. Co., Chicago, Ill.
Mr. and Mrs. N. Regabar, National Paper Products Co., Carthage, N. Y.
Eric A. Rinell, Marinette & Menominee Paper Co., Marinette, Wis.
L. W. Roberts, Cutler Hammer, Inc., Milwaukee, Wis.
Wm. J. Robertson, Heller & Merz Co., New York, N. Y.
Wm. E. Rollinson, Chicago, Ill.
E. W. Romaine, General Naval Stores Co., Cincinnati, Ohio.
Mr. and Mrs. Fred. J. Rooney, The Upson Co., Lockport, N. Y.
Mr. and Mrs. Geo. Roschek, Eagle Paper Co., Joliet, Ill.
C. E. Saecker, Appleton Machine Co., Appleton, Wis.
Fred H. Schatten, Cameron Machine Co., Brooklyn, N. Y.
Mr. and Mrs. R. E. Sears, Shartle Bros. Mch. Co., Middletown, Ohio.
J. Scheuerman, Cameron Machine Co., Brooklyn, N. Y.
J. Carl Schmidt, E. I. duPont Co., Philadelphia, Pa.
Mr. and Mrs. W. E. Scott, The Adams Bag Co., Chagrin Falls, Ohio.
Mr. and Mrs. R. E. Sears, Shartle Bros. Bag Co., Middletown, Ohio.
Alvah Seeber, Blandin Paper Co., Grand Rapids, Minn.
Mr. and Mrs. H. W. Server, Oxford Miami Paper Co., West Carrollton, Ohio.
H. W. Sherman, Northern Paper Mills, Green Bay, Wis.
Geo. F. Shevlin, Sr., Glen Falls, N. Y.
Chas. M. Shipway, Wm. E. Hooper & Sons Co., Philadelphia, Pa.
W. Shonkwiles, Fulton Engineering Co., Inc., Middletown, Ohio.
Mr. and Mrs. P. J. Sievert, Marinette & Menominee Paper Co., Marinette, Wis.
Wm. H. Sievert, Michigan Carton Co., Battle Creek, Mich.

PAGEL HORTON & CO., INC.

347 MADISON AVENUE

NEW YORK CITY

AGENTS

FOR

HUSUM KRAFT

THE WELL KNOWN

HUSUM

KRAFT PULP

O. G. Squires, Shuler & Beninghofen, Hamilton, Ohio.
Mr. and Mrs. Harold A. Skinner, Marathon Paper Mills Co., Wausau, Wis.
C. Skoldebrand, G. D. Jenssen Co., New York, N. Y.
Mr. and Mrs. Joe H. Slater, Excanba Paper Co., Escanba, Mich.
C. B. Smith, Huron Milling Co., Kalamazoo, Mich.
Judson P. Smith, Marathon Paper Mills Co., Wausau, Wis.
Mr. and Mrs. L. E. Smith, Nekoosa Edwards Paper Co., Port Edwards, Wis.
Geo. M. Snyder, Cherry River Paper Co., Richwood, W. Va.
Otis J. Spencer, Locomotive Terminal Imp. Co., Chicago, Ill.
H. E. Stafford, Hawthorne Paper Co., Kalamazoo, Mich.
John Staniak, Jr., Marathon Paper Mills, Menasha, Wis.
Mr. and Mrs. E. F. Stemmler, Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ed. L. Stansel, Provincial Paper Ltd., Mille Rochis, Ont.
Mr. and Mrs. Geo. W. Sterritt, National Biscuit Co., Marseilles, Ill.
R. C. Stewart, Shartle Bros., Middletown, Ohio.
Mr. and Mrs. C. E. Stoke, Tomahawk Kraft Paper Co., Tomahawk, Wis.
R. R. Stoltz, Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
Mr. and Mrs. Norman S. Stone, Mosinee Paper Mills Co., Mosinee, Wis.
Mr. and Mrs. Jerome P. Strasser, Stem Hall Mfg. Co., Chicago.
T. E. Taylor, Merrill Mfg. Co., Merrill, Wis.
William S. Taylor, Gilbert J. Schofield Co., Inc., Albany, N. Y.
E. L. Tewksbury, Stowe and Woodward Co., Newton Upper Falls, Mass.
Wm. H. Theroux, Williams Gray Co., Chicago, Ill.
C. J. Thomas, Hoberg Paper Fibre Co., Green Bay, Wis.
E. G. Thomas, Toledo Scale Co., Toledo, Ohio.
B. D. Tompson, E. C. Atkins Co., Indianapolis, Ind.
F. J. Timmerman, Northern Paper Mills, Green Bay, Wis.
E. U. Titus, D. H. Sheen & Co., Chicago.
S. E. Tomczak, Flambeau Paper Co., Park Falls, Wis.
Ray R. Thompson, Simonds Worden White Co., Dayton, Ohio.
Frank D. Turner, A. M. Meincke, Inc., Chicago.
G. H. Urban, Marathon Paper Mills Co., Rothschild, Wis.
Geo. J. VanCalster, Fort Howard Paper Co., Green Bay, Wis
R. W. Van Kirk, E. I. duPont Co., Chicago.
Robert VanPeenan.
H. K. Vinton, PAPER TRADE JOURNAL, Chicago.
George Voght, Mosinee Paper Mills, Mosinee, Wis.
C. A. Wadsworth, Baker Manufacturing Corp., Saratoga Springs, N. Y.
C. L. Wagner, J. Ross Eng. Corp., New York, N. Y.
R. S. Watson, Allis Chalmers Mfg. Co., Milwaukee, Wis.
R. N. Watts, Cherry Biglow Wire Works, Springfield, Mass.
Paul Wautz, Rockford Fibre Container Co., Rockford, Ill.
E. Weber, National Aniline & Chemical Co., Chicago.
N. C. Weil, Solvay Process Company, Syracuse, N. Y.
Mr. and Mrs. Frank C. Weinkauf, Thilmany Pulp and Paper Co., Appleton, Wis.
W. J. Weed, Electro Bleaching Gas Co., New York, N. Y.
Mrs. Frank Weinkauf, Kaukauna, Wis.
John W. Weiner, See Paper Co., Vicksburg, Miss.
A. J. Weir, Wausau Paper Mills, Brokau, Wis.
Ed. Weirfurter, Nekoosa Edwards Paper Co., Nekoosa, Wis.
L. E. Weiser, National Folding Box Co., New Haven, Conn.
L. Vincent Welch, Union Screen Plate Co., Fitchburg, Mass.
Sidney D. Wells, Paper Mills Laboratories Inc., Quincy, Ill.
S. C. Wentz, P. H. Glatfelter Co., Spring Grove, Pa.
W. B. West, E. D. Jones & Sons Co., Pittsfield, Mass.
Harry E. Weston, The Paper Industry, Chicago, Ill.
W. Weston, American Wringer Co., Woonsocket, R. I.
C. R. Whipple, Beloit Iron Works, ,Beloit, Wis.
Mr. and Mrs. M. M. Whiteman, Rothschild, Wis.
F. A. Whittiger, General Dyestuff Corp., Chicago, Ill.
A. Wiberg, Gilbert Paper Co., Menasha, Wis.
A. W. Wickham, MacAndrews & Forbes Co., Camden, N. J.
A. G. Wightmann, Knowlton Bros., Watertown, N. Y.
Brent Wiley, Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa.
Harry Williamson, Champion Fibre Co., Canton, N. C.
J. H. Williamson, England.
W. H. Williamson, Shuler & Beminghofen, Hamilton, Ohio.
Lee L. Wilson, Morris Paper Mills, Morris, Ill.
P. M. Wilson, Marathon Paper Mills Co., Rothschild, Wis.
Warren R. Winn, Mosinee Paper Mills Co., Mosinee, Wis.
Mr. and Mrs. J. E. Wipfli, Nekoosa Edwards Paper Co., Neekoosa, Wis.
G. L. Wolflin, Oliver United Filters, Chicago, Ill.
J. G. Wright, Jr., A. M. Meinicke, Inc., Chicago, Ill.
Mr. and Mrs. A. T. Yoder, Ontonagon Fibre Co., Ontonagon, Mich.
Mr. and Mrs. John T. Yordy, Howard Paper Co., Urbana, Ohio.
Mr. and Mrs. C. E. Youngchild, Nekoosa Edwards, Port Edwards, Wis.
J. W. Youngchild, Nekoosa Edward, Nekoosa, Wis.
Mrs. Wesley Youngchild, Nekoosa, Wis.
W. K. Yule, Albany, N. Y.
Mr. and Mrs. F. L. Zellers, Wausau Paper Mills Co., Wausau, Wis.
Mr. and Mrs. Herman Zielsdorf, Marathon Paper Mills Co., Rothschild, Wis.

Bagley & Sewall Build New Power House

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., June, 10, 1929.—Construction work on a new power house has been started by the Bagley & Sewall Company east of the main plant directly south of Pearl street. Excavation work was started several weeks ago and the foundation is now being laid. Contractors directing the work expect to have the building ready for occupancy about September 15. The new structure will replace two power houses operated on Moulton Street and will be of the latest type with all modern conveniences. It will be 42 by 28 feet in size which is somewhat larger than the present power plant. The new building will contain two boilers of 200 horsepower capacity and will be constructed of concrete and steel throughout. It will also have an excellent railway siding connecting with the New York Central Railroad.

Gets $4,337 for Loss of Left Leg

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., June 10, 1929.—Compensation of $4,337 has been awarded Martin Kelly, a former employee of the Algonquin Paper Mill, for the loss of his left leg. The decision was handed down by Commissioner James Whipple of the State Industrial Board, and notice of the award has just been received by the claimant's counsel. Under the terms of the award Kelly will receive $873.48 immediately covering the period from April of last year to May 28, 1929 and thereafter $15.06 a week for 230 weeks. The injured man suffered the loss of his leg following an accident at the paper mill when he stepped on a piece of wood while making his rounds. Infection developed following the injury and he was taken to the Hepburn Hospital where it was decided to amputate the foot. The claim was contested several times.

To Build Hydro Electric Plants at Holyoke

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., June 11, 1929.—Announcement was made the past week that the Holyoke Water Power Company will build a hydro electric plant at each of the two overflows, No. 3 by the Germania Mills and No. 4 by the Franklin Paper Company. The water that now wastes at these places will be discharged through turbines geared to generators. About 2,000 hp. will be generated at each place.

What users say of the ---

TERRY Paper Machine Drive -

"Terry turbines giving entire satisfaction." From one mill superintendent to another.

"The turbines are behaving splendidly and we are all well satisfied. From a mill that has just installed its third Terry drive.

"All of the Terry turbines we have installed have worked out very well and we are very much pleased. Says a builder of paper machines.

"It is a good arrangement. On machines that we have built it has worked out very satisfactorily." From a builder of paper machines.

"Again I want to tell you that our turbine installation is the most satisfactory of any which the writer has come in contact with." -- Writes a user of two 450 HP Terry drives.

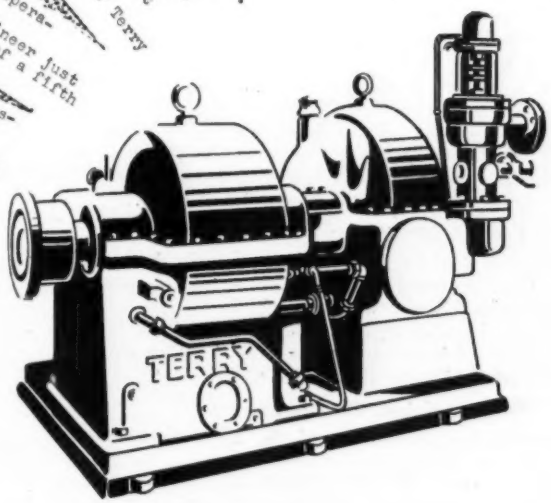
"We are more than satisfied with the operation of the entire unit." Comment of a chief engineer just after the installation of a fifth Terry drive in his mill.

"We are running four Terry turbines on newsprint machines, and one on wrapping. Are working very satisfactorily." -- Writes the superintendent of a mill where Terry drives have been used for over 12 years.

"We have your favor of the 16th regarding the variable speed turbine for paper machine drive and in reply the writer is pleased to state that he has had excellent results with the Terry turbine." From one mill superintendent to another.

"We are obtaining excellent results with the turbine. We are getting ready to install another drive at the present time." From a mid-western mill that installed its first Terry paper machine drive on trial.

"We are highly pleased with the performance of the Terry Steam Turbine which we use for driving our 160" paper machine. The speed control is perfect at all speeds of the machine. Should we put up another paper machine, we would again install the Terry turbine." From a mill superintendent who has been operating a Terry drive for four years.



The Terry Paper Machine Drive is built in all sizes from 30 H.P. to 900 H.P.—for variable speed or constant speed—for high speeds or low speeds—for belt drive or direct connection—for all steam pressures and back pressures. Write for complete information. Cooperative service of our engineers is at your disposal.

The Terry Steam Turbine Company

TERRY SQUARE, HARTFORD, CONN.
OFFICES IN PRINCIPAL CITIES

Steam Turbines · Gears · Shaft Couplings

T-1035

Newfoundland's News Print Production Heavy

Two Big Mills Are Running At Full Capacity With Total Output of 800 Tons Daily—Efficiency of International Paper Co.'s Plant at Corner Brook Greatly Improved—Now Turning Out 500 Tons Per Day—Product of Grand Falls Mills Goes to England

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 10, 1929.—While news print mills in Canada have been on curtailed production for a long time past, the two big news print mills in Newfoundland are running at full capacity. Between them they are producing at the rate of over 800 tons per day.

The Anglo-Newfoundland Development Company's mill at Grand Falls is turning out 312 tons per day. This company is owned by the Harmsworth interests, the proprietors of the *London Daily Mail* and other English newspapers, and the product goes to England.

460 Tons Per Day

The rated capacity of the International Paper Company's mill at Cornerbrook is 460 tons per day. When the mill was acquired by the company in 1928 its average production was 438 tons. Its efficiency has since been greatly improved, and now it is turning out over 500 tons per day, the mill, it is stated, being the lowest cost producer belonging to the company. The mill, it will be remembered, was built by English engineers and capitalists, the Newfoundland Government and the Bank of England joining with the Armstrong-Whitworth Company in promoting the enterprise. Costs, however, so greatly exceeded estimates that finally it was sold to the International Paper Company. The company has undertaken to increase the capacity of the mill to 600 tons a day before 1933. In addition the company is interested in a pulp and paper mill on the Gander River, and by 1933 has undertaken to build a news print plant of a capacity of 200 tons a day.

Spent $25,000,000 on Developments

The former owners of the properties taken over by the International Paper Company spent over $25,000,000 on the developments and the International Paper Company will have spent another $20,000,000 before its program is complete. Most of the product of the company's mill is exported to the United States, although small shipments have been made elsewhere.

Shawinigan Development

Preliminary to the development of the latent water power resources of the St. Maurice River above La Tuque, in accordance with the concession obtained from the Quebec Government, the Shawinigan Water and Power Company is building a line from Shawinigan Falls northward to La Tuque, a distance of approximately 60 miles. This line will eventually connect with the first of four power developments, construction of which must commence by July 1, 1930, and is also designed to serve a new customer, the Brown Corporation, pulp and lumber producer at La Tuque, which will take a maximum of 15,000 hp. over this line.

The Brown Corporation has a sulphate mill at La Tuque with a capacity of 200 tons per day. It also manufactures other products. The company's office is in Portland, Me., H. J. Brown, of Portland, being the president.

Expansion in British Columbia

The Royal Securities Corporation, of Montreal, who control the British Columbia Pulp and Paper Company, are contemplating additional improvements to the two plants at Port Alice and Woodfibre. At the former plant bleached pulp is manufactured and at the latter unbleached pulp. The enterprise formerly belonged to the Whalen Pulp and Paper Company, and was taken over by the present interests in 1925.

The Vancouver Kraft Company has awarded a contract for the construction of a sawmill to cost about $25,000 in connection with its pulp and paper mill at Port Mellon, on Howe Sound, B. C. The company is planning an expenditure of some $1,500,000 in the establishment of a plant to specialize in the manufacture of kraft paper for use as bags and wrapping.

Spottiness in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 10, 1929.—Little change is seen in the paper market here, with spottiness developing in several lines. The demand for building papers has tried hard to develop, but weather conditions continue adverse and there has been a subnormal demand for the spring season thus far.

There is some demand for board papers, but the users seem content to operate with stocks at a minimum and are shopping about for their stocks. They rather are warranted in this because mills are forcing sales to some extent and are making some nice price lists in order to keep business going.

Fine papers seem to be moving regularly. The prices generally are well held and there is a good demand from printers and direct by mail advertisers. The demand for special stocks for commencement programs and wedding invitations has been very good. A large number of school annuals also are being published, reflecting on the demand.

Increasing business in other mercantile lines has reacted favorably in demand for wrapping papers. The business seems equally large as compared with last year and prices uniformly are firm. No heavy stocks are being carried, but the orders are numerous even if for small amounts.

Prices on paper stock are low and a large volume is being bought despite the unfavorable situation with regard to the seller.

Demand for news print is good and prices show no change. During the last week there appears to have been considerably more advertising done in many cities of the state and it is believed this situation will continue for some time.

Veldown Co. May Move Because of Taxes

[FROM OUR REGULAR CORRESPONDENT]

GLEN FALLS, N. J., June 8, 1929.—The Veldown Company, a division of the International Paper Company, is seriously considering the removal of its plant in South Glens Falls to Vermont or New Hampshire unless tax assessments on its mill property are reduced, according to a statement made before the City Council this week by Mayor George Scales. Mayor Scales told members of the board that this information was imparted to him by an official of the company. Last fall the company instituted a court proceeding to compel the assessors of Moreau to show cause why the taxes should not be reduced but final action on the matter has never been taken. The company owns one of the largest tracts of land in the northern section of Saratoga County and recently disposed of the property used as a dwelling by the superintendent in charge of the local plant. The property in Main street near the Hudson River was recently disposed of to the Carter Hall Company for industrial purposes.

J. F. Duggan Goes To Technical Dept.

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., June 11, 1929.—Joseph F. Duggan for the past 10 years manager of the Riverside No. 2 mill of the American Writing Paper Company has been transferred to the Department of Technical Control. On the occasion of his leaving the employees of the plant presented him with a purse of gold.

Praise or Apologies?

Theodore Roosevelt was a vital force in this Nation. His followers were either enthusiastic or apologetic, nevertheless he accomplished results.

The world progresses, aided or hampered by men and events. A business succeeds or fails largely because its owners do things or idly drift. A paper mill, manned by good workers, really interested men, makes good paper and sufficient quantity when its machinery is right.

You are interested in a paper mill. Is your machinery, especially your Beater equipment, right? Do you praise your Beaters or apologize for them? Perhaps the time has come for you to do something about your Beaters.

It is surely better to be a *doer* than a *drifter*, and Dilts New Type Beating Engines in your mill would probably prove one of the best investments you ever made.

The world admires men of action. They make progress. Successful men are progressive. We urge you to prompt action in this case, and it may be vital to you, because "your paper is made in your Beaters."

VICE-PRESIDENT
DILTS MACHINE WORKS, INC.
Fulton, New York

Paper to be Manufactured From Peat Fiber

Peat Products Co., of Portage, Wis., Are Granted Patents For New Process and Intend to Work Aggressively to Establish a Mill—Machines Are Being Developed to Make Cartons and Other Allied Products—Roofings and Shingles Will Be Considered

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 10, 1929.—Patents sought by the Peat Products Company, of Portage, Wis., for the manufacture of paper and wall board from peat fiber have been granted, according to word received by officials of the company from the commissioner of patents at Washington. Now the company intends to work aggressively to establish a mill and begin manufacture and marketing of this new product.

Experiments have been carried on quietly for about two years, and the company believes it has evolved a process that will bring peat-made paper into general commercial use as well as for the lower grade varieties and wall board. It is reported that several men prominent in the paper industry of the Middle West have investigated the process and have voluntarily offered to leave other positions to join the new company. Their names have not been divulged by C. F. Mahnke, assistant secretary and general manager.

Charles C. Roth, a German paper maker, discovered the process which is to be used. In company with W. A. Grahn, of Westfield, Wis., a corporation known as the Roth-Grahn Company was organized with the intention of establishing a mill. Mr. Roth has since died, and the project was revived through Mr. Mahnke. The company was reorganized and is now called the Peat Products Company. Its capital stock was increased to $100,000, and it is reported that half of this amount has been sold. It is possible that the machinery in an idle paper mill in Wisconsin may be purchased and set up. Special machinery also will be required, and expert mechanics are to be hired to build this part of the equipment.

Made From Roots of Wire Grass

In explaining the process to be used, Mr. Mahnke declares that the paper will be made from the roots of the wire grass that grows in peat bogs. The black peat soil is not utilized. These roots are a vegetable fiber of great strength and of gelatinous nature. When beaten, they form an excellent quality of pulp. Board made from this fiber has been treated chemically so that it has the resiliency of rubber or the hardness of oak. It is a non-conductor and is expected to be attractive to the radio industry. Another experiment based on a theory of Mr. Roth has proven that the fiber can be bleached white and that an excellent grade of commercial paper can be produced.

First efforts of the company probably will be in the carton industry. Machines are being developed to make cartons, butter tubs and other allied products. A line of roofing and shingles also will be considered. Experts are to make a survey so as to locate the mill where it will be contiguous to a sufficient supply of peat to last for many years to come.

Officers of the company are: William A. Grahn, president; O. E. Heubner, vice president; W. L. Wohlfert, secretary and treasurer; C. F. Mahnke, assistant secretary and general manager.

Fafnir Bearing Co. Expands

Expansion in the Wisconsin paper mill area is seen in the announcement made last week that the Fafnir Bearing Company, of New Britain, Conn., has purchased the Railway Motors Corporation, of DePere, Wis. The latter company manufactures the Melcher roller journal bearing, which is coming into use in paper mills. Its business in the past has been largely with the railroads whose trains are being equipped with roller bearings.

The Railway Motors Corporation hereafter will be operated as the railway division of the Fafnir Bearing Company, retaining its present sales organization with Lee W. Melcher in charge. Mr. Melcher will locate in Chicago, and conduct the sales from there. A. L. Maltman, of the sales department, A. W. Witbro, of the engineering department, and L. C. Koch, in charge of manufacturing, will remain at DePere.

Installation of roller bearings on paper mill machinery has been promoted quite extensively of late by the DePere concern. The Fort Howard Paper Company, Green Bay, Wis., is fully equipped. Installations are now being made at the Northern Paper Mills, Green Bay, and the Thilmany Pulp and Paper Company, Kaukauna, Wis.

New Paper Plant for Milwaukee

Construction is under way at Milwaukee, Wis., on a large new plant for the American Lace Paper Company, of that city. The plant is to have 150,000 feet of floor space. It will consist of four floors and basement, and is of concrete, steel and brick. The executive offices are to be housed in a separate two story building. Construction work is proceeding rapidly. Practically all of the concrete super-structure is done and the roofing and bricking in of the sidewalls will be accomplished soon. Seven acres of land have been bought by the company, and the buildings are so designed that additions may be made when expansion is necessary.

News of the Industry

June 15 has been set as the date when the Union Bag and Paper Company will close up its mill at Kaukauna, Wis., permanently, according to R. H. Jacoby, resident manager. Announcement was made that this step would be taken some time after May 15. The mill is obsolete and the bag department has been moved to Orange, Tex. About 75 men will be out of employment when the shutdown comes.

Construction of the large addition to the Thilmany Pulp and Paper Company's main mill at Kaukauna, Wis., probably will be completed during July. The addition will house asphalt paper machines and will provide added warehouse space. Concrete is used in the construction, and an asbestos roof is being put on. Several frame buildings were razed to make room for this improvement.

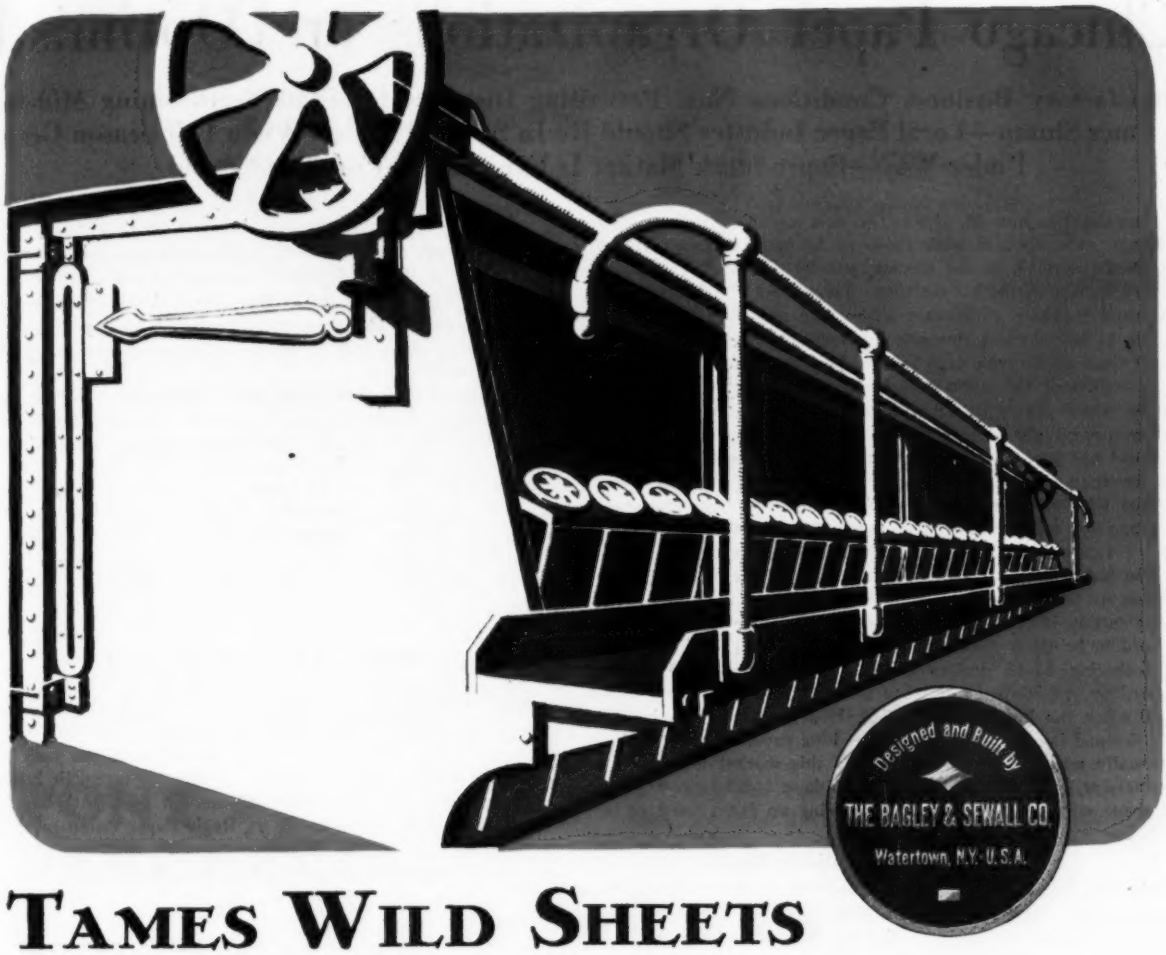
Consistent gains are being shown by the Badger Pulp Mills, Inc., of Peshtigo, Wis., successor to the Peshtigo Paper Company. Reports issued by E. A. Meyer, president, state that net income after all charges was $6,737 for the month of April. Forty new customers were added during March. The company started from scratch in February, after taking over the defunct mill. The new financial setup includes $400,000 in first mortgage bonds, $715,000 in preferred stock, and $385,000 in common stock without par value.

Beautifying of the grounds is in progress at the Hoberg Paper and Fibre Company, Green Bay, Wis. A dumping ground and marsh adjacent to the mill has been filled with earth, gravel and cinders. The mill yard now has two boulevards, a baseball diamond, a tennis court, and a parking space. Curbing and gutter have been built along the drives.

S. F. Shattuck, vice president of the Kimberly-Clark Corporation, Neenah, Wis., has purchased the *Priscilla*, a 60-foot cabin cruising motorboat from Chicago persons, and has brought it to his home himself, piloting it through Lake Michigan and Green Bay. Mr. Shattuck has always been a boating enthusiast.

A sliver which pierced his hand while employed at the sulphate mill of the Thilmany Pulp and Paper Company, Kaukauna, Wis., caused the death of Nick Timmers, 49 years old. Blood poisoning set in and he failed to recover.

John McNaughton, late treasurer and manager of the Outagamie Paper Company, Kaukauna, Wis., left an estate of $200,000, according to his will filed in probate court. The entire sum goes to his widow.



TAMES WILD SHEETS

It's a satisfaction for a machine tender and his bare-foot crew to be able to concentrate on the web of paper reeling up at the finishing end—confident that the head box, a block away, is doing its own job right! That's a strong point with the Bagley & Sewall Head Box—delivering the stuff—without fussing—smoothly, evenly—discouraging the slightest tendency to wildness. Its curved lip, capable of the finest degree of adjustment at all points across its entire width, improves formation and minimizes broke. Precise indicators control slice opening and stock head. Non-corrosive metal throughout—finely finished brass and bronze—with no projections or crannies on the inside for stock lodgement. Well designed—well built—with a more-than-human capacity for co-operation!

We'd like to tell you more about it—write us

The Bagley & Sewall Co.

Watertown, N. Y.

Chicago Paper Organizations are Optimistic

Satisfactory Business Conditions Now Prevailing Discount Effect of Forthcoming Mid-Summer Slump—Local Paper Industry Should Be In Strong Position When Fall Season Gets Under Way—Paper Stock Market Is Exhibiting Firmer Undertone

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 10, 1929.—The first month of June provided Chicago paper houses with sufficient business to give them an optimistic outlook on the coming months despite the slump expected because of the hot weather. Though activity in each line is expected to show a decrease within the next few weeks there seems to be sufficient strength in practically all of the lines to carry them on through until fall business gets under way.

A feature of the markets this week is reported to be strength in the waste papers. Here all items have been fairly active and prices accordingly steady. In the lower grades especially strong demand has been noted. Prices also continue to be very steady in the news print market since matters in that field have been almost wholly cleared up. According to mill representatives in Chicago the mills are running along at an average of about 85 per cent capacity in order to take care of the demand.

The board market would still be in good shape considering the season of the year if it were not for the price situation where price cutting is evidently having its inning. Production in board is said to be fairly good and demand fair but the price business is bothering board dealers considerably. Wrapping paper has slowed up and is not expected to shoot ahead to any great extent until after the hot months. Book is holding up well in price and demand is reported satisfactory. Fine papers are going ahead unusually well and representatives of this market look for fair business at least until the mid-summer days. Mill representatives of tissue mills state that orders are piling up for a week or two ahead.

Chicago Paper Association's Plans

The Tuesday, May 28, meeting of the Chicago Paper Association was not held out of respect for Mrs. Inlander of the Inlander-Steindler Paper Company who died on the Monday previous. Leo S. Altholz, president of the Chicago Paper Association, is a member of the Inlander-Steindler firm. The next meeting of the association is to be held at the Bismarck Hotel, Tuesday evening, June 11, the association to meet in two separate groups and under respective vice-presidents according to a ruling of the association placed in effect four weeks ago. D. F. Peck, of the Hanchett Paper Company, will be in charge of one group and Earl Beier will be in charge of the other.

A part of the meeting will be taken up to complete plans for an outing to be enjoyed some time soon by members of the association and to include golf and other sports, both indoor and outdoor, that make these association gatherings both delightful and educational.

Paper Salesmen to Golf at Long Beach

Tom Donahue, of the Warren Manufacturing Company, chairman of the golf committee of the Chicago Division of the Salesmen's Association of the Paper Industry, will stage the next in the series of summer golf tournaments at Long Beach, Indiana, on Thursday, June 20. A large crowd turned out at the last tournament although it was staged in a pouring rain. Takes a lot of wet weather to dampen the ardor of the Salesmen's Association enthusiasts. Harold Knott, president of the association, has indicated that there will be no more special features at the noon luncheons until the first Monday following Labor Day.

News of the Trade

A large group of publishers from suburban newspapers in the vicinity of Chicago enjoyed a most constructive series of motion pictures on the making of paper which was linked with a very enjoyable visit to the well equipped plant of the Bradner-Smith Company, 333 South Desplaines street, on Monday evening, June 3. The newspaper men were the guests of O. H. Runyon, sales manager of the Bradner-Smith organization and were entertained at a dinner at the Fred Harvey Restaurant prior to the feature of the evening. The motion pictures detailed clearly to the newspaper men present the important steps in the making of the paper and provided them with a better understanding of the problem of paper making.

The Traver Paper and Manufacturing Company, 358 West Ontario street, Chicago, is listed among the new incorporations for the month. The personnel of the incorporating company includes George W. Traver, Paul C. Traver and A. L. Jahn.

P. H. Whaley, of the Whaley-Eaton Service, is to be the main speaker at the meeting of the Salesmen's Association of the Paper industry to be held in conjunction with the Fall Meeting of the National Paper Trade Association, if present efforts to get him are successful, according to one of the Chicago executives of the association.

Estate of Frank A. Empsall

[FROM OUR REGULAR CORRESPONDENT]

DEFERIET, N. Y., June 10, 1929.—The will of Frank A. Empsall, prominently identified with the St. Regis Paper Company until his death, bequeaths the estate entirely to relatives, the bulk being left to the widow and two children. There are no public bequests. It is estimated that the estate will amount to slightly over $4,000,000 comprising stocks in the St. Regis Paper Company, Northeastern Power Company, Northern New York Trust Company, other power stocks and other investments. Mr. Empsall, who died in New York City on May 24, carried life insurance totaling $462,000.

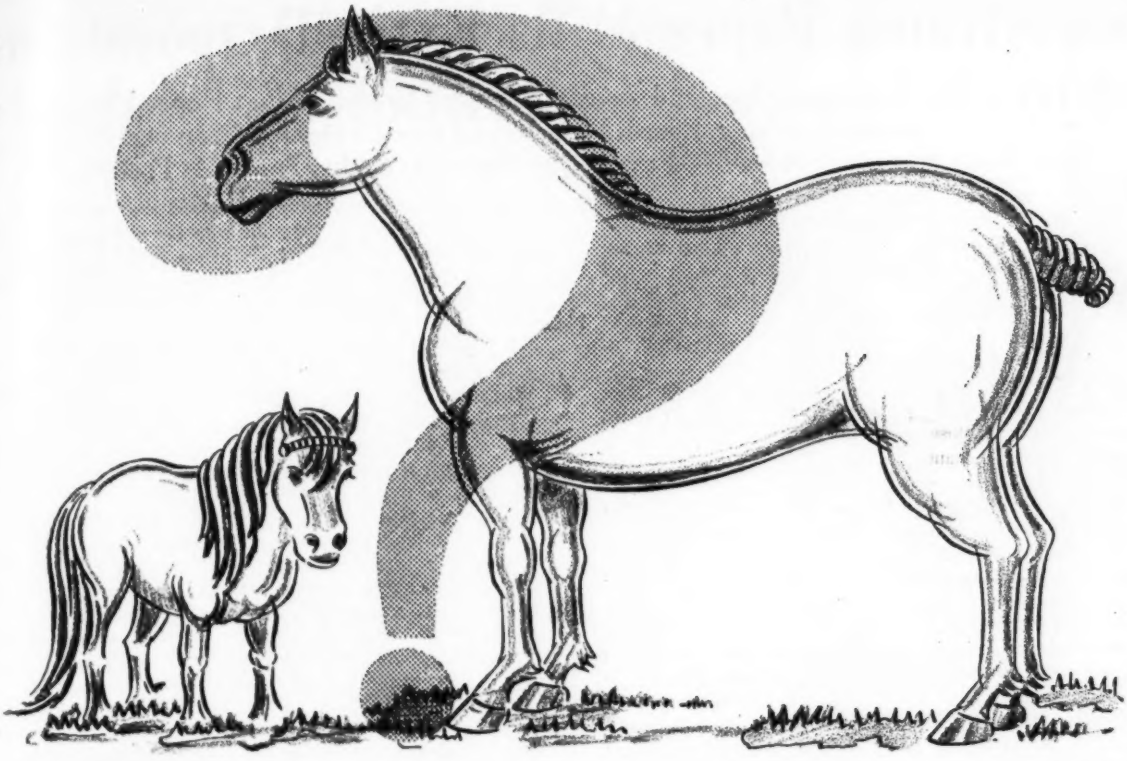
Under the terms of the will the sum of $500,00 is left to the widow, Pauline Empsall, the provision being in lieu of her dower rights. A trust fund of $300,000 is left with the Northern New York Trust Company for the son, Frank Empsall, and a similar fund of $200,000 is bequeathed to the daughters. Four brothers are also beneficiaries. The will was filed for probate last week by Attorney Phelps on behalf of the trustee. The petition entered by the Northern New York Trust Company states that the personal property exceeds $100,000 and the real property exceeds $1,000.

The will directs that the legacies provided for his four brothers and the two trust funds provided for the son and daughter shall be set up and paid out of the estate before the payment of the $500,000 bequest to the widow. The exact amount of the estate will not be known until the transfer tax is paid to the county treasurer. Attorney Charles Phelps, representing the executor, and Attorney Bernard Gray, the trustee, will prepare an accounting of the estate as quickly as possible.

United Wall Paper Mill Gets New Plant

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., June 10, 1929.—It is reported on good authority that the United Wall Paper Company, owners of the Standard Mill in Allen street, have purchased a wall paper mill and equipment consisting of 13 printing machines and one paper machine from the Sears-Roebuck Company in Chicago. It is understood that the firm has also acquired the Eagle Paper Company, at Joliet, Ill., which was also owned by the Sears-Roebuck Company. The acquisition of the new wall paper mills will, it is believed, permit of expansion plans of an extensive nature.



PONY or PERCHERON

Which would you pick ?

Horses are horses,—but the Percheron can walk away with the pony's load,—and the pony thrown in! The Percheron's built that way,—developed for heavy duty by years of careful breeding.

Beaters are beaters,—but the Noble & Wood High Density Beater has been designed and built along *service* lines,—to outwork ordinary beaters three to one. But, unlike the Percheron, the High Density Beater doesn't need an inch more floor space than the less capable members of its family.

Triple capacity in the same floor space? But that's not all. By an ingenious principle this new beater *circulates* its extra load of exceptionally high density stock constantly and thoroughly,—completely hydrates it in considerably less time without undue brushing or fibre mutilation.

Triple the quantity of stock at a dump! Consider the saving in power costs and time. Add to that the fact that stock is better prepared, *more uniform* in quality and color, capable of making a far superior sheet with less machine manipulation. Then decide whether this new type Beater is worth investigating further!

NOBLE & WOOD
MACHINE COMPANY
Hoosick Falls New York

Pennsylvania Paper Mills Extend Operations

Manufacturers of Summer Specialties and Several Standard Grades of Paper Speed Production to Meet Livelier Demand—Paper Board Mills Report Good Volume of Tonnage Booked for Early Summer Schedule—Fine Paper Market Is Rather Spotty At Present

[FROM OUR SPECIAL REPRESENTATIVE]

PHILADELPHIA, Pa., June 10, 1929.—There is a livelier demand for paper of seasonal activity. Now that more normal temperature prevails the trade is beginning to experience broader buying of the belated hot weather paper lines. The mills are likwise enjoying extended operations on these specialties and in some of the standard grades of paper consumed in bulk by the larger printing and publishing houses.

Paper board manufacturers have a good volume of advance tonnage booked for the early summer schedule of production at prices on a parity with those made in January. Specialty mills also report a growing demand. Roofing felts and builders supplies are seasonally active.

The demand for builders papers has not been up to normal owing to the inclement weather that held up building operations. Bogus papers have been fractionally advanced although demand is somewhat curtailed. Kraft manufacturers are diligently seeking for tonnage for summer time operations and advance business for the coming Fall season.

Mid year requirements in fine papers center around certain lines of stationery used by manufacturing stationers and for the accounting departments. Card boards and bristols are in fair demand. Orders for bonds, ledgers, book and cover papers are spotty but the wholesale merchants and mill representatives are enjoying a livelier business in mid year contract deliveries.

Except for the demand for commoner grades of paper stock which are handled in volume by buyers or the larger paper board mills, there has been a reaction from the firmer tone of the market in the previous week. Mills are making inquiries for future deliveries, however, and it is believed by the dealers that there will soon be renewed buying by the manufacturers.

Paper Men To View Port

A day's outing aboard the *John Wanamaker*, owned by the City of Philadelphia, has been arranged by the president of the Philadelphia Paper Trade Association, Simon Walter, for the associates of the local paper industry. The outing and inspection of the Port of Philadelphia will be held on June 11, the guests embarking at the foot of Chestnut street for a trip down the Delaware as far as Wilmington. Members of the New York Paper Trade Association will be the guests of the Philadelphia Association and will reach here in time to embark at 11 a. m. daylight time. The party will have luncheon aboard the *John Wanamaker*. Inspection of the Port and the sail down the River will occupy the entire afternoon.

Paper Trade Association Quarterly Meeting

The quarterly meeting of the combined divisions of the Philadelphia Paper Trade Association will be held on June 21 at the Chamber of Commerce 12th and Walnut street. There will be the routine business transactions of the wrapping and fine paper sections and the reading of the semi-annual reports.

Satterthwaite-Cobaugh Co. Incorporates

Application for a charter of incorporation has been made to the Governor of the State of Pennsylvania by the present proprietors of the Satterthwaite-Cobaugh Company, 221 Chestnut street, dealers in fine papers and printing and publishing grades. The firm has been organized for the past four years and its members are Howard Satterthwaite, Clyde B. Cobaugh and Frank W. Berry. Mr. Satterthwaite organized the company upon his resignation from the management of the book paper department of the Garrett-Buchanan Company and later took into partnership Clyde B. Cobaugh, who was associated with the Standard Paper Company, the Raymond & McNutt Company and the Paper House of Pennsylvania prior to his connection with the firm which he now represents. Frank B. Berry was affiliated with the advertising department of the Dill & Collins Company and later with other paper houses, joining the Satterthwaite-Cobaugh Company over a year ago.

Dill and Collins Electrification Extension

A new policy of electrification has been adopted by the Dill & Collins Company for its mills in the Richmond district. The manufacturers have connected for 1500 K. W. additional power to be served from lines of the Philadelphia Electric Company. Heretofore the power plant of the company has always provided for all electrical energy as well as steam for paper mill requirements. The increased demand, especially for the higher grades of coated papers in the long established Black and White Marks and the Dilfold, the firm's outstanding folding enamel, in all has amounted to 24 per cent increased production, and has necessitated the added power for extended operation, according to the company's announcement of its innovation of the past few weeks. The added power will also be used in operating the coal pulverizers which will soon go into service in two new boiler settings of the mill power plant. These boiler settings are equipped with modern air cooled walls and unit type pulverizers which are expected to give efficiency obtainable under this method of burning coal. Throughout the first five months of the current year the company maintained its mills under full operation with prospects of completing the last half in record production.

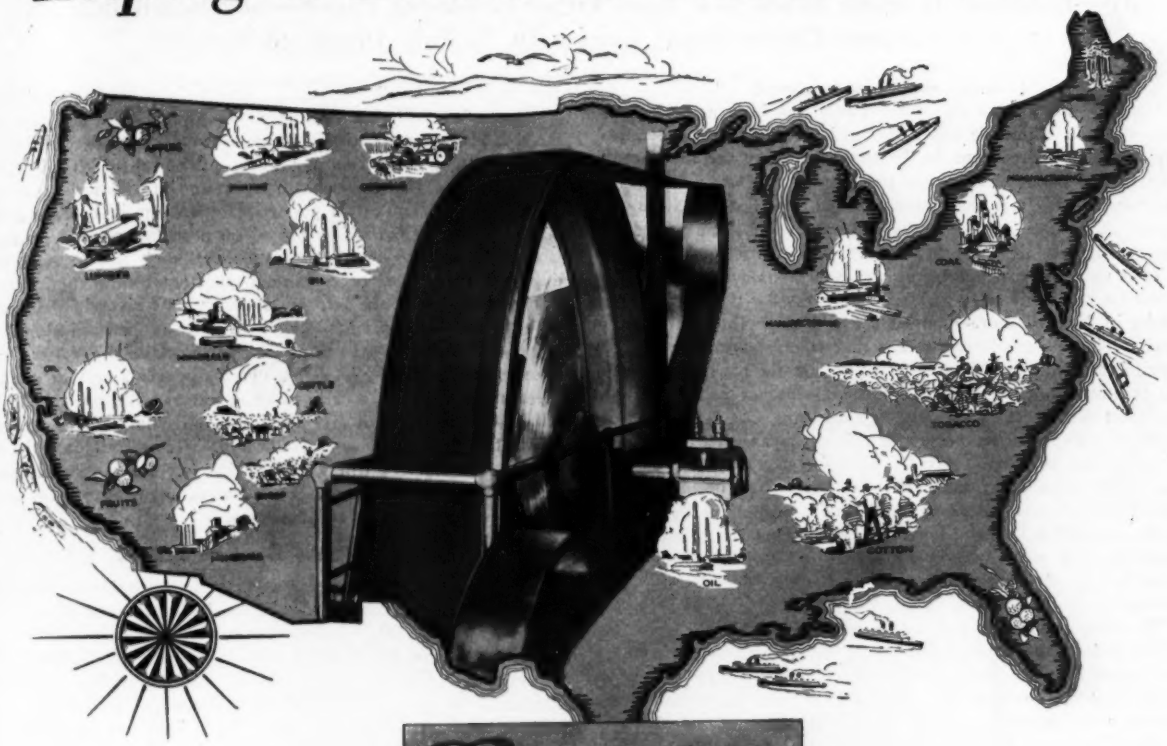
Betzwood to be Site of Paper Plant

Betzwood, Pa., which was the main site for the manufacture of moving pictures in the pioneer days of the industry and where many stars of the screen were launched on the public horizon, is to be reconstructed to meet the needs of the paper industry which will occupy the buildings already erected on the grounds. It was announced last week that E. F. Woodhead & Co., manufacturers of sanitary crepes and tissues and converter of these products, has purchased the 10 acre tract. Removal of the converting department now located in Norristown, Pa., will begin this week and it is expected to have it in operation by mid June. The tissue and crepe mills of the Woodhead company, now located near West Chester, Pa., will also be consolidated in the plant at Betzwood but it is believed it will be a few months before the paper making machinery will be installed and ready for operation. In the new location considerable increase in production of the Woodhead line of toilet rolls, crepe towels and napkins in rolls and flat sizes and allied products is to be effected. When the mills and the converting plants are merged the old paper making plant near West Chester and the converting plant at Norristown will be discontinued. There will be shipping facilities for 8 carloads adjoining the plant on a direct siding and 50,000 square feet of manufacturing space available.

Lindsay Paper Co.'s New Lines

There has been added to the lines of papers distributed by the Lindsay Paper Company, 804 Sansom street, two additional grades of printers papers. These are the new folding coated paper made by the Merrimac Paper Company, of Lawrence, Mass., and the Roloc papers cover of the Chemical Paper Company, Holyoke, Mass. These two new grades are being stocked in their full weights and sizes. The Merrimade Folding Coated paper made in white only but in a wide range of sizes and weights, is being distributed throughout Pennsylvania by the Lindsay Paper Company as exclusive dealers for this territory.

Another Claim to Fame— Helping to Enrich the National Wealth



SPINNING huge pulleys at a terrific speed —driven by a powerful steam engine—defying deadly sulphuric acid fumes—toiling day after day—year in and year out—challenging time—never failing—this Condor Belt gives further justification for its claim to fame.

The picture above shows a 20″ 8 ply Condor Belt operating in the Planters Fertilizer Company in Charleston, S. C. This belt is 90 4/12 ft. long and operates a 16 x 36 Bates Corliss Steam Engine, developing 250 horsepower. The driving pulley is 12 ft. in diameter and develops 110 R.P.M. and the driven pulley is 68″ in diameter.

It is because of service records of this sort that users of Condor Belt are as faithful to Condor as it is to them.

All good belts are made to conform to rigid specifications but Condor carries this to an even greater point of perfection. Its component parts are built for aging. It is steeled against time.

Let us help you solve your belting problems. Our engineers may be able to cut down your belting costs and increase your power efficiency. You will be obligated in no way whatsoever.

THE MANHATTAN RUBBER MANUFACTURING CO.

Executive Offices and Factories : : : PASSAIC, NEW JERSEY

Branches in the Principal Cities

Paper Mills Well Booked Ahead In Ontario

Fine Paper Plants Pressed For Early Deliveries, Although Operating at Practically Full Capacity—Excellent Demand Exists For Many Other Grades of Paper—Box Board Industry Less Active—Coarse Paper Grades In Slightly Improved Request

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 10, 1929.—There has been a distinct improvement in wholesale paper circles in Ontario during the past five weeks and conditions in the trade generally are satisfactory. May yielded excellent business—particularly the last two weeks of the month—and June has opened up well. So far this Spring the record of business is considerably ahead of the same period last year and it looks as if the distributors are in for a good summer—at least until the real holiday season gets under way. One dealer showed a record of sales which gave figures for the first full two weeks in May of more than 40 per cent over the like week in April. The increased sales means that printers are busy for this time of the year and it is a fact that neither the paper dealers nor the printing trade, which is a large consumer of paper, ran into any quiet period during the past five weeks.

The consumption of paper by the printers means that distributors of goods are making a play for out-of-season business, as they have done annually of late. Printed matter for promotion and advertising purposes is being used much more liberally than in years past, which means a lot to the paper wholesalers and manufacturers. In practically every section of the wholesale trade there is a good demand for paper and with prices holding firm the dealers may be said to be prosperous.

The same conditions, for the most part, exist in the manufacturing end of the paper industry, although there seems to have been some over-production of box board and the mills manufacturing that line are less busy than they were a few months ago. However the paper box trade is still quite active and they are making fair requisitions for stock, while prices for raw material continue firm in the board mill list.

Book mills are well booked ahead with orders and there is a strong demand for all lines of bonds, writings and ledgers. Fine paper demand is keeping up remarkably well with the mills all busy and operating close to capacity. There has been some slight improvement in the coarse paper market, although both mills and distributors report that they could handle a good deal more business than is coming their way. In the coated paper section a satisfactory degree of activity exists and business in this department is gradually expanding. This appears to be due to the present high level at which general commercial business is proceeding throughout the province.

Most fine paper mills are being pressed for early delivery and some of them are being pushed rather hard. An excellent volume of business is being done by the light weight paper mills, the call for paper towels, napkins, toilets and tissues generally being ahead of this time last year. The same may be said of greaseproof, glassine and similar lines for which an excellent demand exists.

Business among the paper converters is also showing improvement, the envelope manufacturers and makers of blank books and kindred lines being fairly active after a rather quiet spell early in the Spring. Canadian-made blanks, blotters and manilas are in good call, these lines being somewhat less subject to outside competition than has been the case for some time. There is a satisfactory demand for rag and paper stock, though not overwhelming. It is as good as dealers want it to be, however, as it gives them a chance to build up some reserves of stock before the arrival of the summer holidays when supplies always fall off materially. Collections continue to be good.

Following Up Conservation Act

First steps toward putting into effect the pulpwood conservation act passed at the last session of the Legislature were taken a few days ago by W. C. Cain, Deputy Minister of Lands and Forests, when a circular letter was sent out to Ontario's 800 pulpwood land licensees asking for the information required under the act. To each licensee was sent a copy of the act, which is intended to secure for the Government accurate information as to the amount and extent of all pulpwood operations in order that the forests of Ontario may be placed on a sustained yield, or crop, basis. As well as the copy of the act, each licensee was sent duplicate questionnaires containing questions asking the information required under the act. Instructions were given in accordance with the act that each questionnaire must be returned filled out and signed by officers of the company and a qualified forester. The licensees are mainly companies operating over tracts of varying extents but there are several small operators with minor holdings. All will be required to give the same full data. These questionnaires are returnable by September 1, after which date the departmental foresters will start working out the huge problem of regulating the annual cut so as to preserve Ontario's present forest wealth for all time, as the act aims.

Are Studying Northern Forests

Canada's pulp supply, her forests and the problems connected with the development of them, are receiving the close attention of three members of the Faculty of Forestry, University of Toronto, Professors T. W. Dwight and J. F. White, and R. C. Hosie. Dr. C. D. Howe, dean of the Faculty of Forestry at the University, explained the problems under investigation. "Over 60 per cent of our northern forests," he said, "have been burned during the last half century. We shall have to depend very largely upon these lands for our future supply of pulpwood, and Professor Dwight, in the Sudbury district, is trying to find out what we can expect in the next 25 or 30 years from them. At present these lands are partly covered with trees of value like spruce and balsam, mixed with trees of little or no commercial value, such as birch and poplar. Part of the study is to determine the limits of the areas which will never be productive again and the areas from which pulpwood can be expected to grow. The study resolves itself into growth and yield." Dr. Howe said it is now realized that by fire prevention the future supply of pulpwood can be insured. Professor J. H. White, who was recently appointed chairman of the Forest Research Committee, established by the Ontario Forestry Board, is going to spend the summer studying conditions in the four townships in the Sudbury district set aside for forest investigation by the Legislature. He will study the natural replacement of the pulpwood species after cutting operations. Under the present methods of cutting there is insufficient generation of spruce, for example. The second question is the matter of obtaining a larger yield of pulpwood per acre than now produced in nature's own inconstant way. When an area has been cleared of spruce there grows over the same land, not spruce, but another tree, balsam, perhaps, or some other species. It is reckoned that a study of soil conditions will determine why this is so.

New Fiber Container on Market

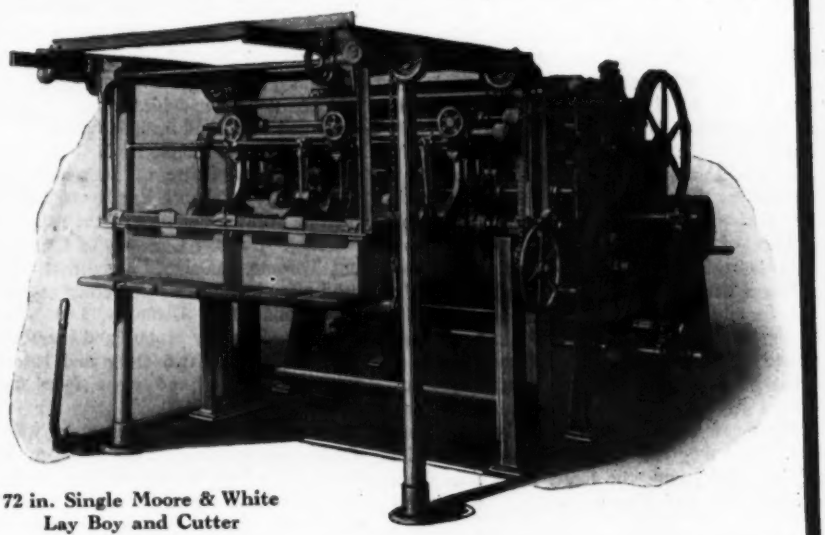
Some time ago the development of an entirely new product for Building Products, Ltd., was announced in the form of a solid fiber shipping container for which the management believed there would be a ready market. It is now a matter of record that last week the company made the first shipment of this product which is being manufactured at the Portneuf, Que., plant. The management states that the new product has not only come up to ex-

"M & W" Lay Boys

Over 1000 "M & W" Lay Boys for laying all kinds of paper, are in operation in connection with all makes of Cutters in finishing rooms or on end of paper machines. By the use of a Lay Boy the cutting expense is reduced considerably as these machines will increase the output of any Cutter.

One operator can handle any number of piles and in some cases one operator runs two or more Cutters, as their operation is automatically controlled.

The space required for the Lay Boy is no more than for the table formerly used in connection with Cutters. Wax and Glazed and Curly Papers successfully handled. Lay Boys can be had for Single, Duplex or Diagonal Cutters.



72 in. Single Moore & White Lay Boy and Cutter

. . . ADVANTAGES

Increased Production—Operates Automatically—Paper Piled Straighter—Saves Labor and Finished Paper—Can be attached to any make of Cutter—Present Trucks can be utilized.

Makes the use of Wide Cutters desirable at High Speed operation—A Trial will convince you—Trial orders accepted—Literature upon request.

THE MOORE & WHITE CO., NORTH PHILA. STATION PHILADELPHIA, PA.

PAPER · MACHINE · BUILDERS

pectations from production standpoint, but that it is already finding a ready market. The new fiber shipping containers are made in their entirety by the company from paper which is produced at the Portneuf mill, the operation extending all the way through to the finished container. This latter operation is handled at the new plant constructed for the purpose at this point. The company, in association with the St. Maurice Valley Corporation, Ltd., now one of the components of Canada Power and Paper Corporation, Ltd., has completed the new mill located at Port Alfred, Que., for the manufacture of "Insul-Board." Another new development of the company was the undertaking of the manufacture and distribution of a new type of thick butt asphalt shingle, which was entirely originated by the organization. All four plants of the company are being operated at a normal rate of capacity. The first four months of the current year have been completed and there is every indication that the full twelve months period will prove a most progressive one following up the excellent headway registered last year.

Government's Forest Policy Attacked

Claims that the present Government of Ontario is alienating the forest wealth of the province and letting it go, untendered and without reserve, into the hands of United States capitalists, were stressed by William E. N. Sinclair, K.C., at a mass meeting of Liberals in Port Arthur, Ont. Mr. Sinclair especially instanced the letting of 2,500 square miles in the Pic River and Black Sturgeon country in 1916, with no work done on the limits, now in the hands of the Backus interests; the English River limits of 3,046 square miles in 1921, under the same conditions, now in the hands of Backus; the Long Lake limits of 3,362 square miles in 1921, in the hands of Backus; in all 11,689 square miles, or 7,000,000 acres, or 100 townships surrendered to American interests. Mr. Sinclair said that the Pulp Conservation Act of 1929 was "just another wing" on the part of the Government, at the people. All these limits were let during the administration of G. Howard Ferguson, then Minister of Lands and Forests, who is now Premier. The speaker characterized the Forestry Act as an advertising scheme; it was window-dressing and publicity for the Government, but not for the people of Ontario. In 1925, he said, McDougall & Hepburn, of Sioux Lookout, had obtained 1,925 acres, unadvertised and untendered for. These limits were let on the excuse that McDougall & Hepburn owed the bank, and wanted the limits to give employment to develop the natural resources. It was really a case for cancellation, and yet the Government let the limits. Now they found the bank had been paid, the Government had been paid, and—the limits have since been sold to the International Pulp and Paper Company, the Liberal leader said.

Notes and Jottings of the Trade

The Ontario Government has named twenty-six leaders in various lines of endeavor—industrial, agricultural and scientific—to serve as an advisory committee to guide the work of the Ontario Research Foundation. One of the number is J. H. Black, vice-president of the Spruce Falls Power and Paper Company, Ltd.

Excavation has been started on the pulp mill at Atholville, N. B., which is being erected by Frasers, Ltd., of Edmundston, N. B. The structure will be two stories high, 200x400 feet in dimension, with concrete foundation, and steel frame. E. G. M. Cape, of Montreal, is the general contractor. The building will be completed by November 15. Steel work on the digester building is now going on.

J. G. Gibson, of Gibson Brothers, barristers, Toronto, and for years secretary of the old Spanish River Pulp and Paper Mills, Ltd., which was taken over by the Abitibi Power and Paper Company, has been made a King's Counsel.

The tug *Reliance* of the Abitibi Power and Paper Company went on the rocks at the head of the rapids at Sault Ste. Marie, Ont., a few days ago, when her steering gear went wrong as she was approaching the Canadian locks down bound. She was in a perilous position for a time until released by tugs which went to her assistance.

Fred W. Halls, of the Fred W. Halls Paper Company, Toronto, and Mrs. Halls, together with Mr. and Mrs. William Henderson, of Henderson Brothers, printers, left recently on a motor trip to St. John, N. B.

The first of the two news print machines at Price Bros. Riverbend mill is ready to commence operations, and the second machine will probably come into operation in the Fall. The new machines have a daily capacity of 125 tons each and when both are operating the capacity of the mill will be about 130,000 tons anuually.

Prosperity and progress greatly advanced by the automobile, on the one hand, and retarded by the race question on the other, were the most abiding impressions of Africa, by Carl Riordan, former president of the Canadian Pulp and Paper Association, who has just returned from an extended three months' tour of Africa and Europe.

One change of interest to Canada was made in the proposed United States Tariff that affects pulpboard in rolls for the manufacture of wall-board. This item formerly carried a duty of 5 per cent which is the same duty as the Canadian duty calls for on imports into this country. The new proposal is that pulpboard in rolls for the manufacture of wall-board shall be dutiable at 10 per cent and that the line of demarcation between paper and board be raised from nine to twelve one-thousandths of an inch.

Bearing a picture of their head office and warehouse in Toronto, and enclosed in a fine art work cover, the Fred W. Halls Paper Company, Ltd., has mailed out samples of Tanton Book, to which line has now been added Blue White Tanton Book, beautiful in color and finish and available in all the standard weights and sizes as shown in the sample book. The sample book contains a reproduction of a picture of four-color process plates sent out at Christmas by Reliance Engravers, Ltd., Toronto, which illustrates the fine printing qualities of the paper.

George A. Fuller Company of Canada, Ltd., Metropolitan Building, Toronto, has signed a contract for the construction of a new head office building on University avenue, Toronto, for the Abitibi Power and Paper Company, Ltd., Bank of Hamilton Building, Toronto. Plans by Marani and Lawson, architects, 38 Bloor street West, call for a two story and basement structure, 50 by 120 feet, of fireproof and stone faced front construction, to cost approximately $200,000.

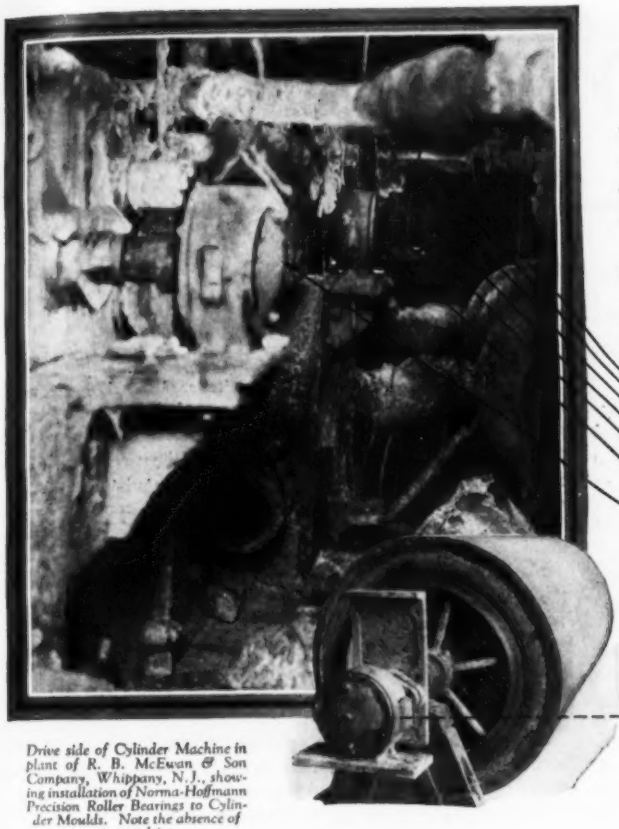
Ben Logie, who for some years was on the sales staff of the old Lincoln Pulp and Paper Company, and later with the Alliance Paper Mills, Ltd., has severed his connection with the latter organization and has joined the sales force of the Canada Paper Company, with offices in the Royal Bank Building, Toronto.

Robert Flynn, of the Buntin Reid Company, Ltd., Toronto, is recovering from an operation performed at his home in Weston, and his many friends are hoping for his early reappearance at his office.

Kenneth Nichol, sales manager at Toronto of the Interlake Tissue Mills, Ltd., was the victim of a serious motor accident and is now in hospital suffering several broken ribs and other injuries. He was returning from London through the night and at Erindale his car left the pavement, turning over into the ditch and burying Mr. Nichol in the wreckage. His companion helped him out and he was then taken to Toronto General Hospital where he is recovering.

Japanese Paper Production

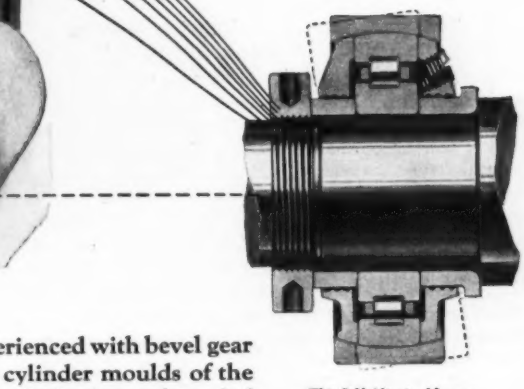
WASHINGTON, D. C., June 12, 1929.—The Japanese Paper Manufacturers Association reports a total output of 57,936 short tons by the mills of the association for the month of March, bringing the total for the first three months of this year up to 173,832 tons, while sales totaled 174,035 tons. Production during the first quarter of last year amounted to 134,377 tons. News print paper represents between 35 and 40 per cent of the total output, while other printings account for an additional 30 per cent.



Drive side of Cylinder Machine in plant of R. B. McEwan & Son Company, Whippany, N.J., showing installation of Norma-Hoffmann Precision Roller Bearings to Cylinder Moulds. Note the absence of power drive

Where

NORMA-HOFFMANN Precision Roller Bearings *eliminated* Cylinder Mould Drive



This Self-Aligning Norma-Hoffmann Precision Roller Bearing has closely fitting side plates to retain lubricant and keep out water

TROUBLES experienced with bevel gear drives for the cylinder moulds of the R. B. McEwan & Son's machine led them to investigate the possibility of doing away with the drive by fitting the cylinder moulds with anti-friction bearings.

An investigation and one installation by the Watson Machine Co., of Paterson, N.J., quickly demonstrated that NORMA-HOFFMANN Precision Roller Bearings so reduced the journal friction that the moulds could be driven by the felt alone.

Later, all of the moulds were so equipped. They have been running for three and a half years in twenty-four hour service. In addition to the elimination of the power drive and its maintenance, it was found that felt life was greatly increased. Lubrication costs were reduced. Shutdowns for bearing repairs became practically unknown. Due to the design of the bearings and their housings, water is kept out and there is no leakage of lubricant.

Norma-Hoffmann engineers have had extensive experience in the applications of bearings in the Paper Industry. They can help you select the most economical bearing for your needs. There is a Norma-Hoffmann for every load and speed condition.

Write for Catalogs,
No. 905 on Ball Bearings,
No. 904 on Roller Bearings,
No. 917 with engineering data, sizes, ratings etc., on the complete line

NORMA-HOFFMANN
PRECISION BEARINGS

NORMA-HOFFMANN BEARINGS CORPORATION - STAMFORD CONN.

NB-965

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Carnegie, Pa.—The Superior Paper Products Company, Carnegie, has tentative plans under way for a new plant unit on local site, to be one-story, 175 x 280 feet, reported to cost close to $180,000, with machinery. It is understood that a list of equipment to be installed is being arranged.

Indianapolis, Ind.—In connection with proposed rebuilding of storage and distributing plant of the United States Corrugated Paper Box Company, 1315 Martindale avenue, lately noted in these columns, company is said to be planning for a new two-story unit on adjoining site, to be used largely for office service, reported to cost about $50,000. Charles E. Bacon, 738 North DeQuincy street, is architect. It is understood that the same architect will prepare plans for the warehouse structure. Richard J. Hauser is secretary and treasurer.

Wellsburg, W. Va.—The S. George Company, Wellsburg, manufacturer of rope paper specialties, has awarded a general contract to the Guilbert Steel Company, Diamond Bank Building, Pittsburgh, Pa., for structural steel framing for a new unit at its plant to be used primarily for general storage and distributing.

Boston, Mass.—The National Paper Products Corporation, recently organized with a capital of $100,000, by George Sherman, 134 University road, Brookline, Mass., and associates, is said to be planning the operation of a local factory for the manufacture of a line of paper goods. Mr. Sherman will be president and treasurer of the new organization.

Cincinnati, Ohio.—Plans have been arranged for a consolidation by the William Koehl Company, 1020-50 Hulbert avenue, manufacturer of set-up and folding boxes, and the Davenport Paper Box Company, 237 Main street, producer of kindred products, the first mentioned company taking over the last noted. The merger is said to represent total assets of close to $1,000,000. It is understood that the Koehl company will continue the Davenport plant in operation as a branch, and that a general expansion and development program will be carried out for increased production.

Hagerstown, Md.—New interests headed by L. A. Bupp, York, Pa., are said to have secured control of the Antietam Paper Company, Hagerstown, and will carry out general reorganization plans. The new owners contemplate an expansion and improvements program for increased output, estimated to cost close to $60,000, including equipment.

Port Angeles, Wash.—The Zellerbach Paper Company, San Francisco, Cal., is reported planning a new paper mill in conjunction with its affiliated properties at Port Angeles, project to include several units with cost reported at close to $5,000,000. E. M. Mills is vice president.

Philadelphia, Pa.—The Reyburn Manufacturing Company, 32nd street and Allegheny avenue, manufacturer of tags, labels and other paper products, has begun the construction of its proposed new plant addition at location noted, to be five-story and basement, 100 x 245 feet, reported to cost approximately $375,000, with equipment. LeRoy B. Rothschild, 215 South Broad street, is architect.

Newark, N. J.—Peter J. Schweitzer, Inc., 170 Cornelison avenue, Jersey City, N. J., manufacturer of tissue and other processed papers, has filed plans for an addition to its recently acquired plant on Frelinghuysen avenue, to be two-story, 37 x 95 feet, reported to cost close to $25,000, with equipment. Work is expected to proceed at an early date; general contract has been let. Nicholas F. Annitto, 706 Bergen avenue, Jersey City, is architect.

Memphis, Tenn.—J. D. Peacock, 1412 Monroe avenue, is at the head of a project to establish and operate a mill in this vicinity for the manufacture of wood pulp, using hardwood waste, willow and cottonwood timber as source of raw material. It is understood that a company will be organized to carry out the project, and that a list of equipment to be installed will be arranged at an early date.

Taunton, Mass.—The Berry Paper Stock Company, Railroad avenue, is said to have authorized plans for the rebuilding of paper plant, recently destroyed by fire with loss reported at close to $75,000, including building, equipment and stock. Reconstruction is expected to run close to like amount.

Monroe, Mich.—The Consolidated Paper Company, East Elm street, has steel superstructure under way on a new addition to plant, recently referred to in these columns, and details of the equipment installation are being perfected. The unit will be one-story, 120 x 600 feet; the mechanical installation will include two high speed cranes, estimated to cost about $10,000, as well as conveying, sorting, dusting and kindred equipment to an amount of about $70,000. Two apron conveyors will be provided, each 630 feet long, and 5 feet wide, and 17 belt conveyors. It is proposed to have the new unit ready for service in August; it will represent an investment of approximately $250,000.

Newark, N. J.—The Sterling Wax Paper Corporation, Newark, has arranged for the sale of its one-story brick factory at 245-51 South street, to the R. G. Smith Tool Manufacturing Company, which will occupy for mechanical production.

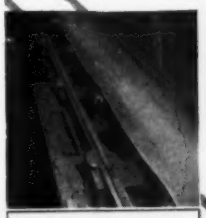
New York, N. Y.—The Amtorg Trading Corporation, 261 Fifth avenue, New York, official buying agency for the Soviet Russian Government, has information regarding a new paper mill project to be constructed by the State Publishing Company, Moscow, said to be the largest such organization in the Soviet Union. It is planned to construct a mill at its own expense; the unit will be located on the Izhora River, and will consist of several units reported to cost 5,000,000 rubles, with machinery. It is understood that considerable American-made equipment will be used in connection with the project.

Oslo, Norway.—The Greaker Cellulose Fabrik, operating a mill for the production of bleached sulphite pulp, has approved plans for improvements in its plant, including the converting of a portion of equipment for pulp production for the artificial silk industry, with the installation of additional machinery for enlarged output. Another similar industry in this vicinity, known as A/S Borregaard, is arranging for enlarged output of bleached sulphite pulp at its mill, from 50,000 to 60,000 tons per annum. Marquard

Jeffrey Engineers are NOT COMMITTED *to any type of Coal or Ashes Handling Equipment*

PIVOTED BUCKET CARRIER

V-BUCKET CONVEYOR


BELT CONVEYOR

SCRAPER CONVEYOR

BUCKET ELEVATOR

SPIRAL CONVEYOR

SKIP HOIST

DRAG CHAIN

NO single unit can successfully meet all coal and ashes handling needs. For this reason, Jeffrey makes many types of coal and ashes handling equipment. Each type has been proved efficient by years of economical service.

In submitting recommendations, Jeffrey Engineers therefore, feel free to select only the type of equipment best suited to each local requirement.

We want you to avail yourself of the accumulated experience of Jeffrey Engineers in planning coal and ashes handling installations. When would you like to talk to one of them?

Catalogs describing any of these units sent on request.

The Jeffrey Manufacturing Company

931-99 North Fourth St., Columbus, Ohio

New York	Rochester, N.Y.	Scranton, Pa	Cleveland	Charleston, W. Va.	Denver	Birmingham
Buffalo	Philadelphia	Boston	Detroit	Milwaukee	Salt Lake City	Houston
Utica	Pittsburgh	Cincinnati	Chicago	St. Louis	Atlanta	

Jeffrey Manufacturing Company, Ltd., of Canada
Head Office, Montreal. Branch Office, Toronto

JEFFREY
MATERIAL HANDLING EQUIPMENT

Jeffrey Products
Elevators—Conveyors
Portable Loaders
Coal and Ashes Handling Equipment
Skip Hoists
Chains and Attachments
Sprocket Wheels—Gears
Crushers—Pulverizers
Sand and Gravel Handling, Washing and Screening Equipment
Locomotives
Mine Equipment
Ventilation Fans

H. Lund, Oslo, Commercial Attache, United States Department of Commerce, has information regarding these projects.

South Bend, Ind.—The John Baumgarth Company, 1219 Washington boulevard, Chicago, Ill., manufacturer of fine paper stocks, calendars, etc., is said to be arranging for the early erection of its new plant at South Bend, for which bids were recently asked on general contract. Project will consist of two main one-story and basement units, 300 x 380 feet, and 85 x 200 feet, the former to be used exclusively for manufacturing service. Frank D. Chase, Inc., 720 North Michigan avenue, Chicago, is architect and engineer.

New Companies, Etc.

Eau Claire, Wis.—The Central Service Paper Company, 409 East Madison street, has been incorporated with a capital of $20,000, to deal in paper products of various kinds. The incorporators are Earl W. Ferguson, Norris N. Abramson and Percy Paige, all of Eau Claire.

York, Pa.—The Pulp Production Company, has been incorporated with capital of $25,000, to manufacture and deal in paper pulp, fiber products, etc. The company is headed by Harry E. Snyder, 149 South George street, and Horace W. Myers, 47 North Sumner street, both of York.

New York, N. Y.—The Great Atlantic Paper Company has been incorporated with capital of $50,000, to manufacture and deal in paper and paper specialties. The company is represented by Konnoson & Konnoson, 170 Broadway, New York.

Marseilles, Ill.—The Crescent Paper Company, Marseilles, has filed notice of company dissolution under state laws.

Chicago, Ill.—The Central States Paper and Envelope Company, 900 West Van Buren street, has been incorporated with capital of $94,750 and 1,300 shares of stock, no par value, to manufacture and deal in paper products. The incorporators are H. D. Pohlman, M. H. Brook and A. E. Larson.

New York, N. Y.—The Seffield Pulp Products, Inc., has been incorporated with capital of $100,000, to manufacture and deal in pulp and pulp products. The company is represented by Delafield, Thorne & Burleigh & Marsh, 44 Wall street, New York.

News of the Boston Paper Trade

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 10, 1929.—The Globe Paper Company has added two more men to the staff. Ernest L. Boyd, formerly with the Carter, Rice & Co. Corporation, is now associated with the concern. Mr. Boyd has had many years of experience in selling a wide variety of papers. He will travel through Metropolitan Boston, Central Massachusetts and part of Rhode Island. Ralph Bass, formerly with the Morgan Ellis Company, has become connected with the Globe Paper Company as salesman. The Globe Paper Company has taken the exclusive agency for the Sabin Robbins Paper Company, Philadelphia, one of the largest handlers of jobs and specialties in the country.

Carter, Rice & Co. Corporation have just distributed to their customers a new sample book of American Embossed Cover, manufactured by the American Writing Paper Company, Inc. This sample book is one of the most practical ever designed, demonstrating the free range of colors, with attractive combinations, and giving suggestions for page layouts. It is also made up in convenient form for filing and ready reference. The book is representative of the other worth while and interesting advertising material now being issued by the American Writing Paper Company.

Charles Casey, of Casey, Bigley & Co., assistant secretary of the New England Paper Merchants Association, who recently underwent an operation for the removal of the appendix, is apparently doing well.

F. A. Norton, sales manager of the Lawless Bros. Paper Mills, East Rochester, N. Y., manufacturers of box board, was in town last week to make arrangements for a permanent representative in the New England market.

Obituary

James Whalen

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 10, 1929.—After a lengthy illness, James Whalen, Port Arthur's most prominent citizen and president of the Whalen Pulp and Paper Mills, died a few days ago in a hospital at Duluth. Mr. and Mrs. Whalen left last winter for California but they got no further than Duluth, where the doctor decreed that he should remain. There he died following a series of spells which gradually weakened his constitution. The late Mr. Whalen was born in Collingwood, Ont., 60 years ago, and had been a resident of Port Arthur, Ont., for 56 years. He was a financial power in Canada before the war. His real estate holdings and varied interests had made him very wealthy, but a slump in values seriously crippled him financially. He had a genius for organizing and was the first president of the Port Arthur Shipbuilding Co.; president and general manager of Dominion Towing and Salvage Company; president General Realty Corporation; president Whalen Pulp and Paper Mills, Ltd., Vancouver, and vice-president Canada West Coast Navigation Company. He was educated at Port Arthur and first engaged in the logging and railway contracting business. Two sons and two daughters survive, while five brothers live in Vancouver.

Peter S. Sinclair

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., June 11, 1929.—Peter S. Sinclair, 63, for many years connected with Holyoke paper mills as master mechanic, died Thursday night at his home 175 Lincoln street. He had been in rather poor health for some years.

He was born in Scotland and his first position was with the Chemical Paper Company under George C. Gill. When the latter bought the old Winona mill and re-named it the George C. Gill mill, Mr. Sinclair was made master mechanic. When this mill was taken over by the American Writing Paper Company he remained for a time, then went with the Grove Paper Company at Newburgh, N. Y. He was there three years, coming back to Holyoke to become master mechanic for the Taylor-Burt Company, now the Taylor-Logan Company. He went from there to take charge of the Holyoke Heater Company in 1911.

He was a member of the Holyoke Rotary Club, Connecticut Valley Knights of Pythias, St. Andrews Commandery Knights Templars, Canadian Club of New York, and New England Association of Gas Engineers. One daughter married J. Louis Perkins, Jr., son of the late J. Louis Perkins, of the American Tissue Mills, Inc., and B. F. Perkins & Son. He also leaves his wife, a son Homer, and two brothers in Holyoke.

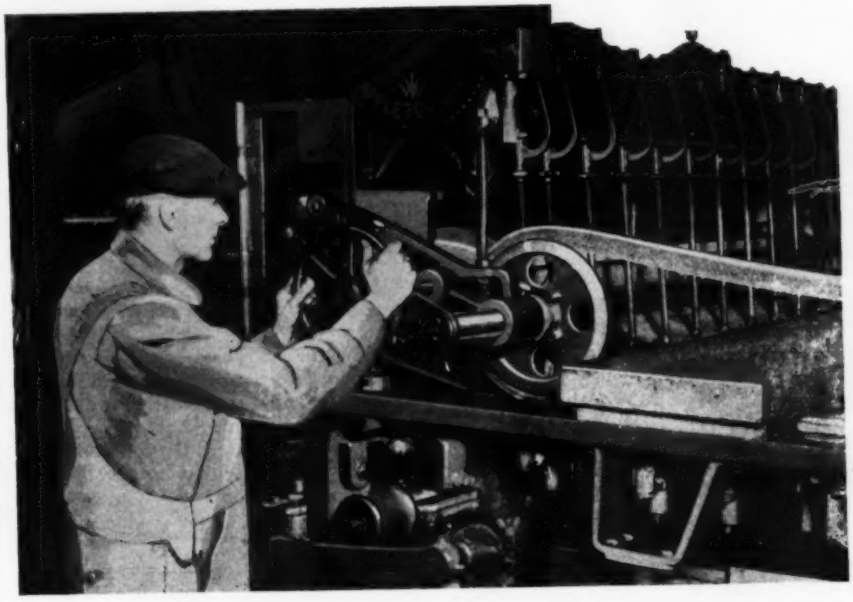
Thomas J. Boddy

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 10, 1929.—The death took place in Toronto a few days ago of one of the city's best known paper salesmen in the person of Thomas J. Boddy, for the past several years connected with the United Paper Mills, Ltd., Spadina avenue, that city. The late Mr. Boddy was previously salesman for the Buntin Reid Company, Ltd., and the Allan Paper Company, Ltd., in Toronto, and was well and favorably known in the city paper trade. He was 52 years of age and leaves a wife and one son. Death resulted from pneumonia.

Indiana Box Co. To Build

INDIANAPOLIS, Ind., June 10, 1929.—The capacity of the Indiana Box Company factory at Elwood, Ind., will be enlarged by a building 60 by 100 feet to cost more than $10,000. D. I. McKenzie is manager of the plant. Work of construction will start at once and the company, after the building is completed, will put about 50 more men to work.



Here is the "Vital Organ" in making good paper

THROUGHOUT the entire process of paper making no point is more vital than the stock inlet.

For here is where the actual sheet is *formed*. Here is where uniformity is determined. Here is where productive tonnage is regulated. Here is where the element of *quality* and *cost* play the most important part in paper mill production.

The 266 users of the Voith High Pressure Stock Inlet know exactly what we mean. They know that no other inlet can give them the productive capacity, the uniform caliper, the low operating cost and the better quality that they are enjoying from their Voith installations.

Let us send you the detailed facts so that you may judge the profit-earning merits of this machine for yourself.

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

New York Offices: 350 Madison Avenue
Western Manufacturing & Sales Division: Smith & Valley Iron Works Co.
Portland, Oregon

New York Trade Jottings

The Miller & Wright Paper Company, of 200 Varick street, New York, have just issued an attractive illustrated folder on Strathmore Saxonet.

* * *

R. C. Quortrup, of the general sales department of the Barrett Company, 40 Rector street, New York, is at present on a business trip through the West.

* * *

The Beekman Paper and Card Company, Inc., of 137-141 Varick street, New York, have added to their lines a shaded board made by the Beveridge Paper Company and known as Cloudtone.

* * *

The Forbes Paper Company, manufacturers representatives, are removing from 32 Laight street to their new building at 362-364 Broadway, New York, and expect to be installed in their new quarters by Saturday, June 15.

* * *

The New York Division of the Salesmen's Association of the Paper Industry held its first golf outing of the season on Tuesday, June 11, at the Leewood Golf Club's Links, Eastchester. The event was favored with ideal weather conditions.

* * *

Major O. M. Porter, secretary of the American Paper and Pulp Association, and J. A. C. Kavanagh, the association's statistician, left New York for Washington, D. C., yesterday, June 12, to attend to various matters of vital interest to the members of their organization.

* * *

Dr. E. O. Merchant, economist of the Paperboard Industries Association, gave an interesting and instructive address on "General Business Conditions" at the regular weekly luncheon and meeting of the New York Division of the Salesmen's Association of the Paper Industry, held at the Canadian Club, Belmont Hotel, New York, last Monday, June 10.

* * *

Irving A. Levis, of 39 Cortlandt street, New York, representing Taylor Lowenstein & Co., naval stores, Mobile, Ala., and U. M. Robinson, of 25 Church street, have been merged as the Levis-Robinson Company and incorporated with $20,000 capital. The new corporation will have its headquarters at 39 Cortlandt street and will continue to represent Taylor, Lowenstein & Co., the Mobile Rosin Oil Company, and several other producers.

Peter Servaas Leaves Bryant Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., June 10, 1929.—Peter Servaas, one of Kalamazoo's best known paper mill men and for the past six years in charge of sales for the Bryant Paper Company, has resigned his post, effective June 15, and will retire. He has no plans for the future. Previous to his connection with the Bryant Paper Company, he was with the Riverview Coated Paper Company, a concern taken over by the Kalamazoo Paper Company.

Mr. Servaas is prominent in Kalamazoo socially and fraternally. In the latter field as exalted ruler of Kalamazoo lodge No. 50, B. P. O. Elks, he has been active in years past in building up that organization.

Decision on Tinted Writing Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 12, 1929.—Frank Dow, Acting Commissioner of Customs has notified the Comptroller of Customs at Baltimore that tinted writing paper and envelopes made from tinted writing paper shall be dutiable at 3 cents per pound and 25 per cent on the paper and 3 cents per pound and 35 per cent on the envelopes. This is in accord with the latest decision of the United States Customs Court which is in conflict with a former decision of that court.

Paper Demand Normal In Boston

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 10, 1929.—Demand for paper is somewhat easier in this market, having "quieted down for the summer," but the volume of business is normal for the time of year. Dealers are apparently fairly well satisfied.

In box board it is a buyers' market, according to a statement in the trade, although few, if any, are reported to be selling chip board less than $35, and some not less than $37.50. The minimum for filled news is $37.50 and some decline to take less than $40. Even at these figures, it is said, manufacturers are selling at a loss.

The waste paper market is rather dull, although prices are generally at the same levels as yet. Mixed papers have shown a decline, however, the No. 1 grade being quoted at .40 to .45, compared with a previous range of .47½ to .50, on account of a lessening demand. The large buyer of foreign book stock in this market, it is understood, is mentioning a price of 1.57½ for this commodity. Indications are that it will be a quiet summer in old papers, although not stagnant.

Good grades of new rags are salable at a fair price. There is not much demand for fiber rags at the present time. In foreign rags one concern paid 1.60 for a good-sized quantity during the last week, but most of the large consumers are favoring 1.55 to 1.60.

St. Helens To Seek Stock Exchange Listing

PORTLAND, Ore., June 7, 1929.—H. J. Barneson & Co., bond house, Portland, are authority for the statement that stockholders of the St. Helens Pulp and Paper Company, which firm operates a pulp and paper mill at St. Helens, Ore., and which last year purchased the plant of the California Bag and Paper Company at Emeryville, moving it to St. Helens, is expecting announcement of application to list the stock on the San Francisco stock or curb exchange.

The company has announced a stock split-up by which 10 shares of new $10 par value common will be given in exchange for one share of present $100 par value common. The purpose of the split-up, which will increase the common from 15,000 to 150,000 shares, is to increase the number of shares preliminary to its listing on the exchange.

The earnings report for 1928 shows a net of $390,861 after tax, interest and depreciation equal to $26.05 on the present amount of common. From the original price of $100 a share this stock has risen in two years to an over-the-counter sales value peak of $230 per share. The book value according to 1928 earnings is announced as $140.71 per share.

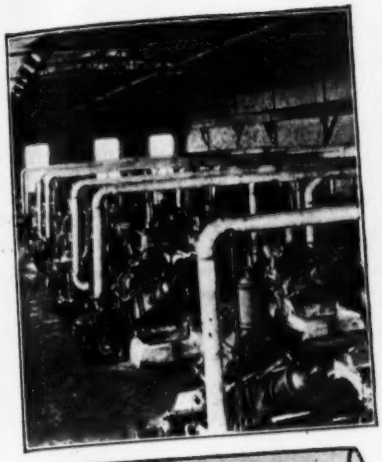
At top price of $230 a share the stock showed a yield of 11.32 per cent on the basis of the 1928 earnings. The only dividend declared thus far on common is a 2 per cent cash dividend paid March 5, 1929.

Notes of the Boston Trade

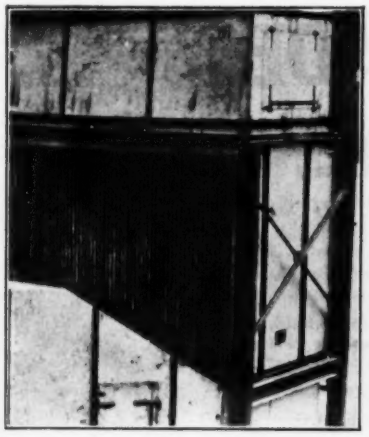
[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 10, 1929.—Robert Hervey, representative of Louis Dejonge & Co., manufacturers of high grade coated papers, spoke at a meeting of the sales force of Carter, Rice & Co. Corporation, Saturday morning, June 8. His talk included a somewhat technical discussion of the various kinds of materials used in the coating process in the manufacture of the Dejonge papers. He described interestingly methods employed by some of the larger printshops in working out their production costs on Dejonge papers compared with some of the other papers on the market. He noted the low production costs possible on account of the high grade of the materials used in the manufacture of the Dejonge papers. These papers have a uniformly smooth and compact surface, allowing true impression and perfect ink control.

Lieutenant Colonel Walter L. Pratt, Military Intelligence, of the Pratt Paper Company, has gone to Fort Ethan Allen, Vermont, on his tour of duty.



ROSS - BAXTER
Grinder Exhaust



BRINER
ECONOMIZER

ROSS - GREWIN
High Pressure

Major Factors in the Modern Method of Heating and Ventilating

Not in a few mills, but in the majority of the most successful paper plants—large and small—the presence of Ross apparatus demonstrates the importance of scientific heating and ventilating methods to insure production, that is profitable. Failure to check the constant damage and waste resulting from inefficient heating and ventilating is costly at any time, but disastrous in the face of present competitive conditions.

The economy of effectively utilizing the heat in waste vapor from the grinders and dryers; elimination of fog in grinder rooms to improve working conditions; increased capacity and improved quality from absorption of troublesome vapor in pockets of the paper machine by means of high pressure air jets; —are some of results that are enabling Ross equipped mills to maintain a decided advantage through lowered operating costs per ton produced.

J. O. ROSS ENGINEERING CORPORATION

208 W. Washington Street, CHICAGO
Main Office—122 East 42nd Street, NEW YORK
519 American Bank Bldg., PORTLAND, ORE.

ROSS ENGINEERING OF CANADA, LIMITED

NEW BIRKS BLDG., MONTREAL

ROSS SYSTEMS

HEATING—VENTILATING—DRYING

PAPER TRADE JOURNAL
ESTABLISHED 1872
10 East 39th St., New York
Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.
Power Engineering Consultant

Member A. B. C. Audit Bureau of Circulations

Vol. LXXXVIII New York, June 13, 1929 No. 24

RUSSIA GETS BIG PAPER MACHINE

At a gathering of prominent business men of Watertown, N. Y., the Bagley & Sewall Company celebrated the recent completion of what is said to be the largest paper making machine ever built in this country. The machine is now being shipped to Russia where it will be used in the Volga Paper Mills.

At the event in Watertown the firm's products were on display while many photographs of former officials were also exhibited. Among them was one of George Bagley, president of the firm from its incorporation in 1883 until his death in 1915. Others shown included life-sized photos of Edmund Q. Sewall, treasurer of the company from 1883 until his death in 1892; George Goulding, who founded the business in 1823 and sold it to Bagley & Sewall in 1853; Charles D. Bingham, who joined the firm in 1887 and was made secretary in 1889; Stuart D. Lansing, who joined the firm in 1888, was made president in 1915, and died in 1927 and Charles W. Valentine, who joined the firm in 1905 as general superintendent and subsequently was elected president in 1927 following the death of Mr. Lansing.

Since 1870 when the firm was commissioned to build the first wood pulp machine constructed in this country it has pioneered in constantly improving the methods of paper manufacture. How to produce more paper and better paper with a given machine always has been and is today the chief problem to which members of the company devote their efforts. Because of its position in the industry from the beginning a real responsibility has rested upon the firm in providing the machinery that could supply the ever increasing demand for paper products.

Possibly there is no better way to impress the tremendous strides that have been made in the improvement of paper-making machinery than to compare one of the first machines built by the firm in 1870 with one of the more recent designs. At that time a Fourdrinier paper machine was built for the Watertown Paper Company which was the first machine to be turned out by the Bagley & Sewall Company. It produced a sheet of paper 38 inches wide at a rate of 100 lineal feet per minute and after fifty years of service is still in operation. Now compare this early machine with the large machine recently built by the firm for the Great Lakes Pulp and Paper Company, of Fort William, Ontario. This giant of the industry produces a finished sheet of paper 292 inches or 24 feet wide and has a maximum rate of speed of approximately 1500 lineal feet per minute. In one hour the machine produces enough paper to print nearly 100,000 sixteen page newspapers. Multiply this hourly capacity by twenty-four and some idea may be gained of the enormous amount of paper turned out every day by this machine alone.

The contribution which the company has made to the advancement of the paper-making industry is not confined to the United States. Bagley & Sewall machines are in operation in Ontario, Quebec, British Columbia, Newfoundland, Mexico, England, France, Norway, Sweden, China and Japan. In the latter country 22 machines are now in use making all kinds of paper from strawboard to fine writing and cigarette paper. The firm has remarkable facilities for turning out paper-making machinery. Considerable of the special machinery in the plant was designed and built by the company for the specific purpose for which it is being used.

The completion of this new monster machine to be located in the far distant Russian Soviet Union adds in an impressive manner to the world-wide prestige in the manufacture of paper making machinery that the company has been building up over a long period of years.

TACOMA TO BE BIG PULP CENTER

With resources that insure a permanent and plentiful supply of raw material for many years to come and the establishment in Tacoma, Wash., already of several important pulp mills, industrial experts, according to the *Tacoma Times*, predict that that city will within a few years be recognized as the center of the rapidly growing pulp and paper industry in the Pacific Northwest. The plants recently started in that city include the sulphite pulp mill of the Union Bag and Paper Power Corporation, a subsidiary of the Union Bag and Paper Corporation of New York, and the sulphite pulp mill of the Shaffer Box Company.

Cheap and plentiful power, huge supplies of waste and log wood at hand or within easy reach, splendid labor conditions, unexcelled climate for year around operation, terminal water rates to world ports, an unlimited water supply and four transcontinental railways are among the reasons Tacoma is recognized as the logical center for pulp manufacturing.

Further proof that eastern capital recognizes Tacoma's importance in the pulp industry is seen in the new Hooker and Tacoma Electrochemical plants, which will produce chemicals used in the paper manufacturing industry.

One of the pioneers in the new industry, which promises to bring millions to the Northwest through the utilization of what was formerly considered waste or low grade wood, is the Shaffer Box Company's pulp mill on the tideflats, built at cost of $670,000, which started operating December 28, 1928, and has found the demand for its sulphite pulp so strong that it has its product sold for many months in advance.

The Shaffer Box company operates one of the largest sawmills and box factories in the Northwest, and in years past 4,000,000 feet of waste wood went into the burners annually, and 6,000,000 feet of low grade stock barely paid for the labor costs of making it into cheap crates.

This wood now goes to the pulp mill where it is made into unbleached sulphite pulp. The waste and low grade wood formerly considered useless, is sufficient to keep the mill operating daily, turning out 50 tons of pulp every 24 hours.

The pulp is sold on the Atlantic coast, in the midwest and Japan. In the pulp mill 100 men are employed, and due to the newness of the industry, young men are being taken and trained for responsible positions as skilled laborers.

The Shaffer Box company saw mill and factory proper employ 500 men and use 45,000,000 feet of hemlock and spruce logs annually, shipping their products to ports all over the world, including Dairen, Shanghai, Hai Phong, Singapore, Australia, New Zealand and Peru.

With addition of the new pulp mill the Shaffer Box company employs 600 men.

The 120-ton sulphate mill of the Union Bag and Paper Power Corporation built at a cost of $2,000,000, has been operating since January 1, and employs 150 men. It is located on the tideflats where the Puyallup river empties into Commencement bay, with both water and rail shipping facilities available.

The buildings are of the finest type of construction, being built entirely of steel brick and reinforced concrete, except where provisions have been for future expansions, in which cases there are temporary walls of Robertson's sheet metal siding.

The chief source of raw material will be mill waste obtained from the St. Paul and Tacoma Lumber Company, which, in order to dispose profitably of sawmill waste, has erected a modern and efficient all-electric sawmill of approximately 250,000 board feet capacity per eight hours, adjacent to the Union Bag and Paper Power Corporation's sulphate pulp mill.

Further proof of the industry's growing importance is seen in the increasing number of vessels calling in Tacoma for cargoes of pulp. Recently the Henry S. Grove took on 800 tons of wood pulp at the Milwaukee dock, following by one day the Lillian Luckenbach, which loaded 1,000 tons at the St. Paul dock.

Brotherhood Negotiates More Agreements

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., June 10, 1929.—A conference is scheduled this week by representatives of the International Brotherhood of Papermakers with the Unity Paper Company at Potsdam regarding the new wage and working agreement. This week was an exceptionally busy one for President William R. Smith as he negotiated agreements with several of the leading paper concerns in Northern New York. During the early part of the week he conferred with Corwin T. Jewell, of the St. Regis Paper Company, and visited the plants at Deferiet, Norwood, Raymondville and Norfolk. From Watertown Mr. Smith journeyed to New York City for a conference with officials of the M. and O. Paper Company, of International Falls, Minn. Frank P. Barry, vice president of the union, returned to this city Wednesday from Ottawa where he negotiated a new agreement with the J. R. Booth Company of that city.

Sefton Plant at Anderson Busy

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 10, 1929.—The Sefton Manufacturing plant at Anderson, Ind., is operating at full capacity, according to John Hyde, superintendent. The company manufactures corrugated paper and boxes. Some departments of the plant are working overtime.

Gatineau Storage Dam Nearing Completion

The Gatineau Power Company, controlled by the Canadian Hydro-Electric Corporation, Ltd., a subsidiary of the International Paper and Power Company, reports that its new storage dam on the upper Gatineau River is nearing completion. The reservoir above the dam already holds three billion cubic feet of water and storage of the balance of its capacity will be commenced about September 30 when construction on other cut-off dams is completed.

The new dam—storing the waters of Lake Cabonga—and the present Mercier storage dam will form reservoirs ranking with the large water-storage systems of the world. The aggregate capacity of the two reservoirs will be 145 billion cubic feet or one and two-thirds times that of the reservoir created by the famous Assouan dam on the Nile River in Egypt.

Of a capacity of 45 billion cubic feet and draining a territory of 1,150 square miles, the Cabonga reservoir will materially assist the Mercier reservoir in regulating the flow of the Gatineau River on which the Gatineau Power Company has three hydro-electric plants of a combined designed capacity of 562,000 horsepower, of which 436,000 horsepower is installed and in operation. The largest of these stations—the Paugan plant—is thirty-five miles north of Ottawa, has an installed capacity of 204,000 horsepower, and is delivering electric energy to the Hydro-Electric Power Commission of Ontario for distribution by the Commission in the Toronto area to supplement the power now being supplied from Niagara Falls.

The Gatineau Power Company has had a particularly impressive growth and now ranks as one of the largest producers of electric power in the world. In the first four months of this year the Company generated 643,664,000 kilowatt hours, 89 per cent greater than the output of the company in the same period of last year.

To Open New Mill at Lynchburg

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, June 10, 1929.—Thomas Harvey, Middletown paper manufacturer and member of the Gardner-Harvey Company, of that city, and who also is interested in other paper enterprises, went to Lynchburg, Va., the latter part of the past week to supervise the opening operations of a new paper mill, organized by himself.

Walter Hadley, formerly of Middletown, will be the superintendent of the mill. He has been in Lynchburg for some time supervising the installation of machinery and equipment.

Mr. Harvey designed the new plant to utilize material heretofore thrown away as worthless. The buildings formerly were used by a company that extracted tannic acid from chestnut wood.

This plan has been followed by the Mead Company and the Gardner Container Company, Miami Valley concerns, it is understood with success, the former concern furnishing material for the latter. The Mead Company handles the chestnut chips in the South where material is plentiful.

It is now interested in the big plant at Harriman, Tenn., which will be devoted to the same line of manufacture, it is reported.

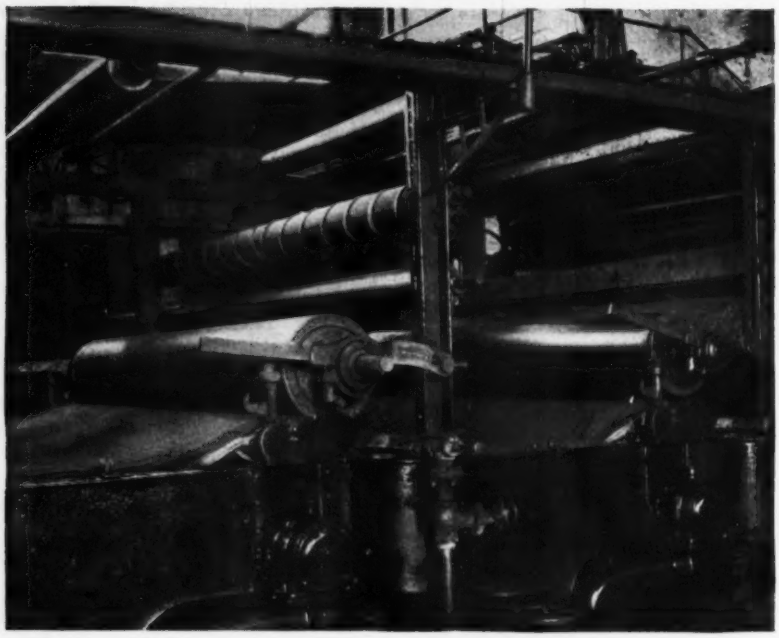
Each day sees greater progress being made in putting that plant in shape to be operated, following the damage sustained during the recent flood.

To Hold Kraft Trade Practice Conference

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 12, 1929.—The kraft paper trade practice conference with the Federal Trade Commission will be held in this city on June 28 at the United States Chamber of Commerce building, with Commissioner William E. Humphrey, presiding, according to announcement just made.

Among the subjects to be discussed by the kraft paper men are: inducing breach of contract, price discriminations, sales below cost, publication of fictitious prices, and false reports of capacity, sales, orders of shipments.



Cylinder molds on board machine showing Goodrich Vulcalock couch rolls.

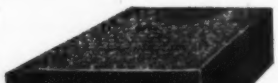
This couch roll will pay for itself in *extra* wear alone

THE reason why Goodrich Vulcalock couch rolls will earn their cost against any other type of couch roll made is to be found in the exclusive process by which they are made.

This process — the Vulcalock Process—does away entirely with the hard rubber base heretofcre used in couch rolls. The Vulcalock Process makes possible an inseparable bond between the cover and the core — a bond as strong as the rubber itself. An adhesion of 500 lbs. to the square inch is effected.

As a result, it is possible to cure the rubber cover with absolute evenness. The density is uniformly soft throughout the entire thickness of the cover —straight to the core.

Vulcalock couch rolls can be used until the rubber is worn down close to the core.



Aeroboard head box linings protect quality of the paper

Superior to African mahogany, cypress or other wood lining because Aeroboard does not accumulate slime and dirt. "Slugs" and imperfections in the sheet are substantially reduced. Head boxes lined with Aeroboard can be quickly hosed out while felts are being washed. Any good millwright can apply Aeroboard in your own plant by following our easy instructions. The box can be made absolutely waterproof. Send for details.

Check List of Goodrich Products used in the Paper Industry: Vulcalock couch, worm, and press rolls ' Highflex belting ' Rubber-lined pipe and fittings ' Fire, water, air and steam hose ' Cutless rubber bearings, rubber-lined tanks, screen diaphragms, gaskets, packing ' Flexite buckets and dippers.

That is why Vulcalock couch rolls have such a remarkable toughness and resistance to edge wear. That is why Vulcalock couch rolls are making outstanding economy and efficiency records in competition with both felt rolls and old-type rubber rolls.

Vulcalock couch rolls may now be obtained with rubber attached by the Vulcalock Process to an aluminum core. Weight of aluminum couch rolls is two-thirds less than rolls made with cast iron core. Aluminum couch rolls are especially adapted to cylinder machines making tissue.

* * *

We will gladly send additional information. Write to The B. F. Goodrich Rubber Company, Est. 1870, Akron, O. (In the West, Pacific Goodrich Rubber Co., Los Angeles, Cal.) or fill in the coupon below.

Goodrich

THE B. F. GOODRICH RUBBER CO., Akron, Ohio
(In the West, Pacific Goodrich Rubber Co., Los Angeles, Cal.)

Gentlemen: Please send, without obligation to me, a sample section of Aeroboard and data on its application to head box lining.

Name .....

Firm .....

Address .....

PTJ-7

Section of the
Technical Association of the Pulp and Paper Industry

AN ORGANIZATION FOR THE ENCOURAGEMENT OF ORIGINAL INVESTIGATION AND RESEARCH WORK IN MILL ENGINEERING AND THE CHEMISTRY OF PAPER, CELLULOSE AND PAPER-MAKING FIBERS GENERALLY; IT AIMS TO PROVIDE MEANS FOR THE INTERCHANGE OF IDEAS AMONG ITS MEMBERS IN ORDER THAT PROCESSES OF MANUFACTURE MAY BE MADE MORE EFFICIENT AND IMPROVED ALONG TECHNICAL LINES.

Edited by
RONALD G. MACDONALD, Secretary

Paper Machine Drier Drainage*

By A. E. Broughton[1]

The most effective mechanical operations are always the simplest. It is reasonable to assume that the drainage of the paper machine can also be made simple, and it is, as long as nature is allowed to operate. The mechanical and complicated means of draining paper machine dryers by means of forced circulation, individual traps and orifices, ejectors and mechanical dippers inside the dryers, have been in use for a great many years. It is my object to explain a simple, natural paper machine drainage system in which nature itself is the presiding force of evacuation. This system is the exact opposite of every other known scheme or system in existence. It lets nature do what man has tried to do mechanically.

Paper-makers in England more than a hundred years ago built wood fires in each drier to supply the heat. With the application of steam as the drying medium, however, it became necessary to work out some method for evacuating the condensate.

The first attempt at a system ever devised, probably sixty or eighty years ago, was no system at all—simply blowing the steam straight through the machine and outdoors. The next step was to save this wasted steam by the use of either a water leg in the discharge line or by using a large individual pot-trap.

Either of these two schemes saves steam but they made the operation of the paper machine unsteady. It is evident that when the discharge was closed, the pressure in the return-header was equivalent to the pressure in the dryers. Just as long as every syphon pipe in the machine was perfectly tight this scheme worked nicely.

In this first scheme one of the syphons may break, or get loose, or twist up, and the instant that happens, the return-header begins to get its pressure from this dryer with a defective pipe. The rest of the dryers in the machine have kept on collecting condensate and immersed their syphons. This one defective syphon pipe was not immersed to its open-inside the dryer and therefore furnished steam pressure into the return-header and throughout the entire system of syphons outside the dryers.

It is easy to see that all the rest of the dryers kept on collecting condensate until the heating surface on the machine was so decreased that in order to maintain a given drying rate it was necessary to raise the operating pressure. Each dryer with its two inch (or larger) steam inlet connection was able to take this increase in pressure rapidly.

The pressure in the entire return system being supplied from this one defective syphon pipe could not be increased as fast as that of the dryers above. Therefore, a difference in pressure was set up and all the syphons went to work instantly, causing what is known as a slug. This would empty the paper machine quickly, increasing its heating surface and making the paper too dry. Pressure accordingly would be reduced and the first operation of loading would again take place.

First Automatic Steam Controls

This, right here, was the birth of automatic steam controls, with which you are very familiar. The trouble of loading and slugging was recognized, but not completely understood. Engineering brains began thinking about some method of curing the effect. What they should have done was to eliminate the cause. A very evident cure of the effect was keeping the steam moving to some extent from the dryers with the water of condensate. This was the birth of the many recirculating schemes in use today.

To obtain utmost efficiency from your steam, it is necessary that not one ounce of steam ever be wasted. This is accomplished by maintaining at all times the same pressure in the return-header as in the dryers above, supplying it. This dates right back to the first idea; namely, that of the water-leg or pot-trap, only this time an ordinary swing-check valve is installed in each syphon return just before it enters the return header. This check is so placed that the header cannot back up into the dryers. The return-header itself is constantly discharging the condensate by gravitation through any one of a dozen types of apparatus suitable for that work.

The collection of condensate in the dryers above, immersing the syphons, shuts off the tiny bit of steam that has been entering the syphon to replace radiation losses in the syphon lines outside the dryers. Radiation keeps on taking pressure, using what steam is left in these lines outside the dryers and since the check in the bottom and the water in the dryer at the top form a definite seal, this line outside the dryer down to the check-valve almost instantly drops its pressure. The water in the dryer is then sucked up into the pipe and once it gets over the hill, it drops by gravity through the check-valve into the return-header and the operation is ready to repeat itself.

In other words, nature is permitted to set up an individual vacuum pump for each dryer which goes into operation only and instantly when it is necessary. Each dryer is being relieved of its water in tiny intermittent slugs. This, however, is so rapid, each slug following its predecessor so closely, that the friction inside the syphon helps each one to catch up with the other, and looking at this flow through a sight feed glass in the syphon outside the dryer, it will look like a steady stream about the size of a lead

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 7, 1929.
[1] Healy-Ruff Co., St. Paul, Minn.

pencil or smaller. The check down below opens up enough to let this water pass through it and rides in that position. In other words, it becomes a graduated orifice adapting itself for all conditions of evacuation from the smallest of openings to the full pipe size.

It is evident that this water of condensation in the return-header, being at the same pressure as the dryers, will naturally be at a temperature equivalent to that pressure. It is also evident that this water can be removed from the header by a float valve, tilt-trap, or water-locked pump, and the problem of steam never enters into the operation. It is also evident that each dryer is a unit by itself or has what is known as individual control.

This check valve lasts indefinitely and requires no adjustment. It is immaterial whether or not they are tight, for their duty is that of an orifice with a relatively large amount of water to handle. *No mixing of cendensate with cooling water is ever required to accomplish the evacuation of the dryers.*

Pressure Gradient

By arranging the system in groups the machine can be operated in one pressure or a graduation of pressures, and right here a word is necessary on graduation of pressures. The paper trade has been educated for fifty years on recirculating drainage systems. That scheme is practically the only one they knew. These systems cannot operate any other way, and exceedingly clever talks have been built up attempting to explain why it was necessary to operate a paper machine with a graduation of pressures.

The elimination of air is perhaps of far greater importance than the removal of the water. Air has a specific gravity or weight a little less than twice that of steam. It is evident that two fluids, one nearly twice as heavy as the other, must separate, the heavier dropping to the bottom. That is exactly what takes place in a dryer.

The syphon pipe having its opening near the bottom of the dryer naturally is immersed in air if there is any air in the dryer. This air because of its proximity to the steam, is heavily laden with moisture and is at the same temperature as the steam. In fact it might be called heavy air-saturated steam. This mixture however, will do very little active heating and wherever these pockets of so called air-saturated steam occurs in dryers, it materially decreases the action from the heating surface. A thermometer on the surface of the dryer however would not show this condition for the sensible heat of the steam and air being the same, the surface temperature of the dryer would be the equivalent of that of the steam alone. However, the latent heat or power in the steam has been greatly decreased.

The effect of this heavy air-saturated steam in the dryers is to form what might be termed a "dead" heating medium. Its effect on fine papers is to transmit its heat too slowly into the sheet, thereby causing the outside film of the paper to over-dry before the heat has penetrated into the middle.

This baked surface on the sheet causes uneven expansion, and cockling is very often apt to occur. Where this condition has occurred it has only been partially understood, the assumption being that the sensible heat was too high, caused by too high a steam pressure. The pressure was accordingly lowered, lowering the sensible heat, slowing up the formation of this baked film on the paper, and permitting the heat to penetrate into the middle of the sheet in time to allow even expansion, and the cockling usually disappeared. Decreasing the pressure, however, decreased the drying capacity of the machine with a resulting detrimental effect on production.

A cure can be accomplished without being costly by removing the heavy air-saturated steam from the dryers. The heating surface then becomes exceedingly live and before the paper can over-surface dry, the necessary heat has penetrated into the center. The problem however is to remove this heavy air-saturated steam. Nature will accomplish this naturally if given a chance but until this system came into existence she never had that chance.

Imagine a barrel placed up over a scaffold. This barrel is full of water and has a syphon pipe running from the bottom up over the rim and down about 15 or 20 feet. The syphon is started in this barrel and a steady stream is coming from the pipe outside. When the water gets down to about half way, nature seems to say to herself, "I am picking water out of this barrel which is a great deal heavier than the air immediately above it." And just as soon as she is able to overcome the sealing effect of the head of water, she will draw air usually down the side of the syphon pipe through the water and into the intake end of the syphon thereby breaking its action. The barrel will still contain considerable water and the syphon has stopped. If there are two weights on the floor one twice as heavy as the other and one of them must be picked up, it is natural that the lightest one comes first.

Assume, then, a steady flow from a syphon pipe inside of the dryer where there is air and steam and it is evident that before all the air is drawn from that dryer, the steam will be by-passed through it, to monopolize the syphon pipe simply because of the difference in weight between the two fluids to which the syphon has access. As long as the syphon pipe is allowed to flow, this left over air will remain in the dryer eliminating itself very gradually by a process of absorption into the water of condensate. The harder a *syphon pipe is permitted to blow on a Monday morning, the less air will be taken from the machine.* Every system or scheme which permits a steady flow from the syphons is subject to air-locking and a resulting decrease in drying capacity.

It is necessary that this system be equipped with a device which will permit the escape of air at any temperatures or pressure but will instantly close when steam strikes it.

On Monday morning this apparatus is wide open, due to the presence of air throughout the entire paper machine and return-headers. The steam is turned on the dryers, entering through the journals, and filling the dryers from the top down. The air below the steam is being pushed into the syphons and out through this apparatus. The air has access to the full diameter of all pipes, not being hindered by orifices or restricted fittings. Finally the air is removed to a point in the dryers where the steam starts to by-pass through it and enters the return-header.

The moment this steam strikes this apparatus it is automatically closed, thereby relieving the return-header of its vent. This return-header being supplied from the dryers alone immediately comes up to the pressure of the dryers, thereby stopping the flow of steam through the syphons. The heavy steam-saturated air in the dryers again immerses the syphon and is drawn into it following each little slug of water, as has been previously explained. The return-header again becomes filled with this hot, damp air and the releasing apparatus opens up, relieving the air immediately and drawing steam to it, again causing it to close. This action takes place several times on Monday morning until every bit of air has been entirely eliminated, releasing the active heating surface on the paper machine and thereby permitting the lowest operating pressure for any given rate of production.

This will permit the largest paper machine built to be started to full operating speed at ordinary operating pressure in not to exceed thirty minutes, insofar as drying governs these factors. A test was run recently on an ordinary news print machine in a well known Canadian mill, and it took just eleven minutes to start the machine from cold to full operating drying capacity, and without any loss whatever in steam and condensate.

Paper machines operating under one pressure will graduate their temperatures to suit themselves. Nature takes care of that by natural means. The wet end of the dryers are considerably cooler on the surface than four or five dryers into the machine, and this increase in surface temperature takes place evenly and gradually.

Many claims are made to show why decreasing pressure at the wet end is necessary. The beater and the Jordan can usually settle these claims very effectively. It is necessary with some grades of board to decrease pressure slightly at the wet end, but this is usually true because the machine itself is being pushed to a limit of production where an extremely high pressure is being used on the dry end.

The Sulphate Process and Kraft Paper*

By George Voght[1]

The sulphate process was invented in Danzig, Germany, by C. F. Dahl, who took out a patent in 1884. Before that time the Manchester Paper Company of New York had found that by cooking straw with sodium sulphide instead of the commonly used sodium hydroxide, a better yield and quality could be obtained. Due to this discovery, the Eaton Fibre Company erected a factory in Brooklyn to produce sodium sulphide in larger quantities so that this product could be used in cooking rather than the sodium hydroxide. However, this work, which was done in the sixties, did not turn out very well commercially, as neither did work done in the same line in Austria at the end of the seventies. Aussig had a patent in 1882 for cooking with sodium sulphide, and it seems that Dahl got his idea from that. In order that he would not infringe on the Aussig patent. Dahl used sodium sulphate, which at that time was a by-product from the hydrochloric acid industry and was practically worthless, to replace the sodium lost in the process. From this use of sodium sulphate came the name "sulphate" process, which in itself is misleading as the sulphate as a cooking medium is inert and does not become active until changed to sulphide. The pioneer to whom a great deal of credit is due for the practical application of this method is G. F. Eenderlein.

F. Stroermer built a soda mill in Bamble, Norway, which was managed by Director Consul, Theodore Peterson, and Technical Manager, G. F. Enderlein. The Dahl patent was introduced there after Dahl had started to use sodium sulphate at Danzig where he was manager. As the mill in Danzig is no longer in existence, the Bamble mill is probably the oldest sulphate mill at this time. By using sodium sulphate to replace the soda ash commonly used in soda mills, Dahl found a cheaper chemical and at the same time introduced sulphide in the liquor which formerly contained only straight hydroxide lye. He thereby accomplished two things:

1. A better lye to cook with — increasing the yield and quality of the pulp.
2. A cheaper chemical to replace process losses.

The machinery in this mill was designed for the soda process, and it was Mr. Enderlein who first introduced the rotary in place of the cumbersome long flat drying oven, and later the disc evaporator. The rotary digester was invented in 1853 in England.

Pulp Process

The raw material for the pulp is treated in the same way as for the sulphite and soda pulp processes; that is, barked (sometimes not), chipped, screened and is then ready for the digesters. At the time the sulphate process began to be used, all the mills were equipped with rotary digesters and the sulphate mills naturally used this type also. They were usually two ton digesters. In later years many stationary digesters have replaced the rotary. The rotary digester has the advantage in giving a uniform cook without any circulation device, and many still believe it to be the better type. As the rotary digesters require much heavier construction, many of the new mills have gone over to the stationary, making them up to seven tons.

While the digester is being filled with chips, the measured amount of lye is flowing in, thereby packing the chips better in the digester. As the lye, containing about 400 to 750 pounds of sodium oxide per ton of pulp, is not enough to thoroughly saturate the chips, additional so-called black lye is used which is recovered from the cooking process. After this operation is completed, the top of the digester is bolted on and the cooking process begins by heating the contents of the digester. There are several methods for this operation. One of the older is the introduction of live steam direct in the digester through a perforated coil. A newer method is the indirect method whereby the liquor is preheated in a separate heater and introduced in the top of the digester with a circulating pump and drawn off at the bottom. The Morterud system is of the latter type. A later indirect system is the Schauffelberger system whereby the liquor is introduced at the top and bottom and drawn off at the middle of the digester through a perforated mantel on the inside. These indirect heating systems have been used mostly on the stationary digesters, but the Morterud system can also be applied to the rotary digester. The indirect systems have the advantage in giving a stronger recovery liquor, as the condensate from the steam will not mix with the liquor as in the direct heating system. The digester is relieved after some pressure has been built up. This is necessary as the temperature without relieving would not correspond to the pressure, and both are essential for a good cook. When the cook is finished, the digester is hooked up with the blow line (a pipe line leading to the diffusers) and the pulp is blown over with a pressure of 60 to 90 pounds. The cycle for a digester—filling, cooking and blowing—varies with the kind of pulp desired and the type of digester, from two to six hours.

The pulp is blown over to the diffusers which are now more common than the old type of wash tank. Lately even suction filters have been used to wash the pulp, but with little success on account of the heavy foam. In the latter case the pulp is blown trough a separator. The more commonly used diffusers are a battery of cylindrical tanks with perforated false bottoms and separators at the top for relieving the steam. This steam is usually led to a condenser for heating water used for washing the pulp. After the pulp is blown in the diffuser, so-called weak black liquor is pumped in at the top of the diffuser after the relief line has been closed. This weak liquor is from a previously filled diffuser from which the strong black liquor has been recovered. The valve or line leading to a strong black liquor tank is opened and the washing begins. This wash liquor is tested and when it runs below a certain point in strength this valve is closed and another valve opened whereby the weak black liquor is transferred either to a tank or put on top of a freshly blown diffuser. While the strong black liquor is being worked out of the pulp, warm water is pumped on top of the weak black liquor first introduced in the diffuser. When all the black liquor has been washed out of the diffuser, the pulp is ready to be dumped in the stock chest. This is done by opening a door in the side of the diffuser located even with the false bottom of the diffuser. Most of the pulp will thereby be removed and the rest is washed out with a high pressure water hose.

The Recovery System

One of the most essential parts for a successful mill is the recovery. The strong black liquor as received from the diffuser is pumped over the recovery room. It is here that Enderlein worked successfully. Before his time this black liquor was evaporated in long ovens where the liquor ran in and was slowly worked over to the other end where the furnace was located, the hot gases from the furnace striking over the liquor. The liquor had to be worked by hand with long hoes the whole length of the evaporating troughs. The rotary was here introduced, first as a batch evaporator, and then by Enderlein as a continuous evaporator placed after the furnace. To utilize still more of the heat from the furnace after it passes the rotary, Enderlein invented his disc evaporator consisting of a closed chamber with two sets of rotat-

* Presented at Annual Meeting of American Pulp and Paper Mill Superintendents Association, Wausau, Wis., June 6, 1929.

[1] Supt. Mosinee Paper Mill Co., Mosinee, Wis.

ing discs dipping in the black liquor at the bottom of the closed chamber with two sets of rotating discs dipped in the black liquor at the bottom of the closed chamber through which the hot gases pass after they leave the rotary. A considerable evaporation of the water from the black liquor takes place here, and this thickened black liquor is fed in the rotary from where it comes out in nearly dry condition, forming what is called "black ash". At the time, the improvements of Enderlein revolutionized the whole industry, and up to a few years ago this method was used most widely. To better recover the heat and increase the rate of evaporation of the black liquor, multiple effect vacuum evaporators were installed. Several types of these evaporators exist but all work on the same principles. The most efficient is the rapid circulating type. This was the outstanding addition to the Enderlein type. With this addition the system was used until a few years ago when, on account of stricter economy, the disc had to give way to the boiler, and the steam produced here used to evaporate the black liquor in the more efficient multiple effect vacuum evaporator.

After the black liquor had been received as black ash from the rotary, the amount of sodium sulphate necessary to replace the manufacturing loss of sodium is mixed with the black ash and the mixture introduced in the furnace.

The furnace is constructed either as a single or double furnace and fired with the black ash mentioned above. The double furnace is used most and the fire opening is on top. On account of the high heat—2000 degrees F. and over—it has been hard to obtain a material that will not fuse, especially as the material used to fire is so high in sodium salts. Soapstone has proved to be the best material so far. In starting up, the furnace must be heated and this is usually done with wood. After the furnace is going good, the black ash is introduced. It contains about 50 per cent organic matter and is in itself a good fuel. No extra fuel need to be added unless the black ash, on account of previous treatments, has lost much of its fuel value, or the wood itself (from which the pulp is made) is poor in rosins and other important fuel qualities. In the latter case extra fuel in the form of wood must be added. To keep a good fire in the furnace there are two to four air nozzles leading into the fuel bed, working under air pressure from one to twelve inches of water. To protect the nozzles from the heat they are water jacketed. The size of the air nozzle varies from three to twelve inches in diameter. In the furnace the organic matter is burned out, the sodium salts are molten and the sodium sulphate is reduced more or less by the high temperature and carbon from the organic matter in the black ash. This mixture of salts, sodium carbonate, sodium-sulphdie, sulphite and sulphate, several impurities such as salts of iron, silicate, etc., run in molten form from the furnace in a tank that has been filled with washing from the causticizing room (mentioned later) so-called weak white liquor. After the liquid in the dissolving tank has gained sufficient strength the liquor, called green liquor on account of its greenish color from impurities of iron, is pumped over to the causticizing room.

Causticizing

The causticizing room has several cylindrical tanks holding enough liquor for several cooks. These tanks are equipped with agitators. After the green liquor has been pumped in, the sodium carbonate has to be converted into sodium hydroxide. This is done by the regular process of mixing the green liquor with calcium oxide (quick lime, burned lime) or calcium hydroxide—calcium oxide preferred because of the heat given off when slacking the lime. The heat is necessary for good causticizing, which is the process that takes place when the carbonate of the sodium carbonate, or commonly called soda ash, is split off and combines with the lime, turning the soda ash over to hydroxide which is a cooking medium whereas the carbonate is not. After an hour or more agitation of this mixture at boiling temperature, the agitator is stopped and the contents of the tank allowed to settle. The clear liquor, now called strong white liquor, is siphoned off into a storage tank from which the necessary cooking liquor is drawn and the recovery cycle is complete.

The sludge, the remaining settlement in the tank, is washed first in tank, and after settling, drawn off again in same manner as the strong white liquor and is called weak white liquor. It is used for filling up the dissolving tank in the recovery room. Now water—usually warm—is filled in causticizing tank, agitated and washed over a suction filter. The washed substance, or sludge, is usually waste and is disposed of in the best manner possible. Reburning the sludge has been attempeted, but without much success as yet. It makes a good fertilizer and is being used on many farms.

Coming back to the washed pulp dumped in the stock chest, this contains uncooked chips and knots which have to be removed. This is accomplished by knotters and screens. The knotter is usually a rotating cylinder with coarse perforation enclosed in a housing. There are two types of screens—flat and centrifugal. The flat screens, as the name indicates, consist of flat plates, slotted, forming a false bottom of a box. The centrifugal screen is a perforated cylinder against which the diluted stock is thrown by centrifugal force. The stock, very much diluted with water, is pumped first to the knotter where knots and larger uncooked wood are separated from the stock, and then the screens take out the remaining smaller undesirable material. The stock going through the screens is then led to either the wet machines where the water is taken out to about 40 per cent or to the deckers. If led to the wet machines, the cylinder mold, a cylinder jacketed by a screen wire, takes out most of the water and a press roll squeezes out the rest to 40 per cent. The pulp is carried by a felt from the cylinder mold under the press roll and comes from the roll in laps and is stored or shipped. When the pulp is to be made into paper at the mill direct, it is pumped to the decker, as mentioned before. The decker has the same mold as the wet machine, but a relatively light felt roll rests directly on the mold, picking up the pulp which is then scraped off the roll and the resulting thick pulp drops in a chest from which the beaters are supplied.

For making the kraft paper, the cooking process must be controlled carefully. The highest possible strength must be obtained and, therefore, the pulp fiber must be treated as gently as possible. Too much cooking liquor, wrong quality of liquor, too high steam pressure, too long cooking time will all have a weakening effect of the fiber. Then again too much reduction of all these factors will give a raw cook which, in most cases, is worthless and goes to waste. Also, a wrong treatment of the stock in beaters and Jordans will spoil the best kraft pulp. Here the paper mill and the pulp mill have to work very closely together for best results. The beating engines are the same for practically all kinds of paper and are so well known a description of them hardly seems necessary. The beating of kraft has to be done just as carefully as the cooking of the pulp because a certain freeness or slowness of the stock is necessary, as well as the hydration relative to the cutting of the fiber. The formation on the wire of the paper machine must be just right for best results. Also the drying of the paper is important as an over-drying will break down the fiber.

Plans Complete For Mill Addition

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, ORE., June 7, 1928.—Plans have been completed and approval has been officially given from headquarters at San Francisco on an addition for the plant of the Ramer Pulp and Paper Company at Shelton, Washington. Work is expected to start soon.

The addition will be in the nature of increasing the digester capacity by adding a fourth digester in the new section which is to be constructed of concrete to conform to present architecture. The new building will be 25 by 40 feet and will be 100 feet high, or only slightly lower than the 125 foot towers of the present digester plants.

Rosin Size in Papermaking*

By C. E. Mueller[1]

During the past few years and especially since the adoption of the hydrogen ion method of determining acidity of stock, the paper mills have taken an active interest in checking up the quantities of alum used in their various furnishes. This is important not only from a cost standpoint but also because of the part that acidity plays in the deterioration of paper.

Due to the importance of this item, the service department of the chemical companies have been called upon by numerous paper mills to check up their alum conditions and to determine the quantities to be used with various furnishes. This was found to be a very difficult problem, as the number of variables encountered in each mill and also in different mills is large and the problem of establishing definite operating standards is very complicated. In the final analysis, the best operating conditions of acidity can only be met by striking a balance of the factors involved and on many of these we have very little information and that which is available is not entirely reliable.

Several recent publications has given experimental data which indicates that there is no optimum pH or acidity which can be used in the manufacture of all grades of paper or even in the manufacture of the same grades of paper by different mills. W. F. Hoffman has done considerable work on the deterioration of paper and has shown that it will deteriorate appreciably on aging if the acidity of the furnish and the resulting paper is not kept within certain specified limits, i.e., if the acidity is high, the paper will deteriorate rapidly, the Mullen Test will drop, and the paper becomes brittle on aging.

In the manufacture of paper, alum is usually used to set the size and if only the theoretical quantity is added to set the size, there will be no excess acidity. However, this is not true as in practically every instance an excess of alum is used. This excess of alum is supposed to be of value in preventing foam, in setting the color, in giving better rattle to the paper, increasing filler retention, decreasing the stickiness of stock, increasing the strength of the sheet, as well as curing many other ills occurring in the making of paper.

From the above statement one might infer that alum is a cure-all for all troubles in the paper mill, but you all know that very little definite information is available as to just what effect alum has in the various factors listed above.

According to the latest information, the best pH for precipitating rosin with alum in a water solution is approximately 5.5 and it requires approximately 1/3 lb. of alum to 1 lb. of bone dry size. An acidity represented by pH 5.5 may or may not be the one which will give maximum sizing results. In some instances mills claim that the best results are obtained with a pH of 4, while others claim a pH of 7 is satisfactory. This wide variation is in part due to lack of standardization on that place in the system where the pH should be taken.

As mentioned before, there are factors to be considered other than sizing, i.e., certain dyes are affected by the pH of the furnish. This means that both sizing and color must often be taken into consideration when determining the amount of alum to be added.

Considerable experimental work has been done on the effect of acidity on the retention of fillers. These tests show that there is a relation existing between the amount of filler retained and the amount of alum added and the pH of the furnish. Naturally the question arises, "Is this increased retention due to the acidity or to the additional aluminum hydroxide or both?" This is another factor which must be taken into consideration.

If certain physical properties are desirable in a particular type of paper and if alum aids in obtaining these properties, then this factor must also be reckoned with.

There are many difficulties encountered in running a paper machine, such as, foaming, stickiness, pitch troubles, etc., which are materialy influenced by the acidity of the stock and which introduce another factor.

Lastly, but undoubtedly of more importance than is usually given to it, is the effect of the acidity of the furnish on the paper mill equipment. An acidity equivalent to pH 4.0 or less will cause corrosion to take place at a much more rapid rate than if the furnish has an acidity equivalent to pH 6.0 or 7.0

From the above discussion one can readily see why it is impossible for anyone to endeavor to tell a mill what acidity they should use on any grade of paper. It is absolutely necessary in every case to take all factors into consideration before attempting to arrive at any conclusion whatsoever.

Alum-Size Ratio

For a number of years it has been a popular conception among paper mill operators that a 2 to 1 ratio between alum and size was the ideal condition. There is absolutely no basis for any such ratio as far as sizing is concerned because only a small portion of the alum is used to precipitate the size, the remainder being required to lower the acidity of the stock, water, etc., to that pH value where the size will be precipitated. The ratio of size to alum may vary between very wide limits due to the fact that the major portion of the alum is consumed by the stock, water, etc., and there is just as much stock, water, etc., in the beater no matter what percent of size is used. Therefore, the alum-size ratio will be high when only a small amount of size is used and low when a large amount of size is used.

Here is a specific instance where a mill was using an excess of alum. The mill claimed that their paper was sized properly, but upon being stored for some time became brittle and the size was held responsible. On testing their paper it was found to contain a rather large quantity of acid, as they were carrying a very large excess of alum at the machine. The alum was reduced over 50 percent and the paper made under these conditions was satisfactory. Here the mill improved its product and at the same time saved thousands of dollars annually.

Here is another case where the acidity of the stock in the beater materially affected the sizing. The mill claimed that its sizing was very irregular. Examination of circumstances revealed the fact that the mill had on hand a considerable quantity of old ground wood lying unsheltered in the yard and which at periodic intervals was being used up in small amounts. This material was found to be sour to the taste and rotten to the smell. The water extract when added to a rosin size emulsion effectively precipitated the emulsion. At the same time, the water entering the mill was carefully checked and it was found that at most times it proved to be alkaline, but very frequently would turn to the acid side. This trouble was due to mills located a short distance upstream which were discharging waste sulphite liquors directly into the stream. This was not only making their beaters acid before charging the size, but also making their sulphite pulp acid when washed after bleaching. Elimination of the sour ground wood and neutralization of the beaters with soda ash or silicate effectively remedied the trouble.

Heat Affects Sizing

All of us are no doubt familiar with the injurious effect of excessive heat on sizing. However, a specific instance of this may be worth mentioning at this time.

An emergency call was received in connection with slack sizing and on reaching the mill it was found that this had at first been attributed to defective rosin size. The mill management had even

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 6, 1929.

[1] Paper Makers Chemical Co., Kalamazoo, Mich.

gone so far as to run a tank of emulsion, representing 1000 pounds of rosin size, into the sewer, so that a new batch of emulsion could be made up as they assumed that the trouble was due to some fault of the particular batch of rosin size emulsion. The new batch of emulsion gave no better results and a check-up indicated that the emulsion was normal and should be satisfactory in every way. In the meantime the size had been increased in the beaters from 3 percent to 12 percent and while the sizing test had been increased to some extent, it was still below normal.

Inspection of the beater room showed that the men furnishing the beaters were using hot water to soften waste papers and while they had been given instructions to add cold water before furnishing the balance of the stock, they found it easier and more convenient to have the hot water valve open, so that the final temperature in the beaters was found to be excessive. Instructions were given to change this procedure and to add enough cold water to cool the beaters to around 110 deg. F. and at the same time the rosin size was cut to 4 percent as it was realized that all over this would be wasted. Inside of an hour the sizing tests had gone back to normal and during the day it was possible to cut the size below 4.0 percent, or in other words back to normal conditions.

Proper drying on the paper machine is an important factor in obtaining the best sizing efficiency and it is likely to be underestimated in favor of speed and better heat economy on the machine. While too much suction on the boxes and the couch has a tendency to leave the wire side of the sheet somewhat slack sized, un-uniform pressure across the press rolls or deficiencies of felts will form streaks of better or poorer water resistance in the sheet. Much more important than this, however, is correct drying in the steam heated cylinders of the machine. The best results are said to be obtained if the temperature of the dryers does not exceed 115 deg. C. If this temperature is reached too early or too late, that means before incipient fusion or so-called "sintering" of the film of resinous matter has taken place, this film will be destroyed by explosive steam passing through it. It is quite true that loft drying will render engine sized paper waterproof without any sintering of the impervious coating. But it has been shown by actual mill tests that properly conducted drying on steam heated cylinders will give perfect waterproofing if the temperature of fusion of the rosin is reached when the sheet contains about 50 per cent water. For the final drying the temperature should be gradually increased in order to preserve the impervious coat as complete as possible.

Rosin Spots

Another trouble in a paper mill is rosin spots. Where suspended free rosin is in a partially emulsified condition when added to the paper stock, it will have a tendency to adhere either to the paper fibers or to the wire and presses and it will gather other particles of rosin until small masses of the rosin are formed. These masses may cause translucent spots in the paper or they may retard the operation of the machine.

To overcome this trouble some operators have suggested the use of protective colloids in the beaters to prevent the conglomeration of these particles. This may help in some specific cases, but the general remedy for this trouble is the prevention of its occurrence by proper emulsification and diluting methods.

There is another type of rosin spot which comes from the natural resins, which are present in the wood, especially in unbleached sulphite or in pulp made from green wood. This trouble usually appears in warm weather and the pitchy material tends to collect on the wire, press rolls, and felts. Recent investigations have shown that the formation of this pitch on the machine is governed by the rate of decomposition of alum and that its appearance in the summer months may be at least partially prevented by regulating the rate of dissociation of alum by cooling the stock before the addition of the alum.

Froth is still another trouble and whenever it occurs on the paper machine, the general tendency is to increase the amount of alum used in the beater. This increased acidity will make the individual froth bubbles smaller due to the change of surface tension, but at the same time, it also makes them harder to break up by means of sprays. Recently it has been found that the tendency of a solution to froth is decreased as the acidity decreases and as aluminum hydroxide and basic sulphate are precipitated. Increasing the pH concentration by adding more alum will, therefore, actually increase the formation of froth, although it decreases the size of the individual bubbles.

One of the chief causes of froth is bleach liquor residues or sulphite waste liquor present in the stock. The froth formed by the latter is very troublesome and very hard to be broken up by water sprays.

From here on instead of dealing in generalities we will deal solely with actual problems that have been encountered in various paper mills throughout the country.

In one particular case a mill was trying to run a certain order and was using rag stock from the same drainer which had been used several months before in making the same paper. At this particular time, however, it seemed impossible to get a well sized sheet. This was laid at first to water conditions and later to the rosin size itself, and in fact almost every conceivable experiment was tried in order to obtain the high degree of sizing which was required on this particular order.

On checking back through the records it was found that this particular batch of rag stock had been in the drainer for about six months, and working on the theory that it might have deteriorated in the meantime, the half stock, as they call it, was dug out of the drainer, put back in the washers, and bleached very lightly. The bleach was then washed out and the stock was dropped back into the drainer.

A few days later this stock was again brought to the beater room and the same order was tried again and it was found that the sizing was very satisfactory. From this it would seem that the effect of bleaching and washing was what was needed to put this stock back in condition to permit efficient sizing. This conclusion was drawn from the fact that as far as could be determined no other changes were made.

Another mill called for service as an unknown material was collecting on the wire which from all appearances seemed to be rosin. The material was a dry, finely pulverized brown, hard material, which under the microscope appeared as amber-colored, transparent crystals. It had the exact appearance of "G" Rosin. Upon examination, however, it did not give any of the characteristic tests for rosin and on analysis was found to contain 50 per cent alumina on the dry basis and it also contained considerable silica and sulphate. Examination of the alum being used showed it to be exceptionally high in basic alumina. The mill at the time of using this alum was using a very large excess as well as charging large amounts of silicate of soda to the beater. This material was practically all a basic aluminum silicate caused by the excessive use of this material. A reduction in the amount of silicate of soda, the amount of alum, and the use of a less basic alum corrected this trouble.

In another case the mill was having trouble with the stock being full of colored specks. These specks could first be seen after the stock left the fan pump. They were not present in the beaters, or in the chests, or the sand table. However, blue and purple specks could be seen floating in the stock. The foam at the head box beyond the slices on the apron was colored, and in it could be seen these same small specks. The foam seemed to break away and be carried into the stock going over the wire and appeared in the surface of the dry sheet as tiny blue specks. The bleaching operation was checked and found to be satisfactory. Changing the grade of sulphite stock had no effect. The alum was doubled without any effect. The following order of furnishing the beater was tried:

Size — Color — Alum	No Effect
Size — Alum — Color	" "
Alum — Size — Color	" "
Color — Size — Alum	Specks decreased in size and number but were not completely eliminated.

The size was increased from 2 pounds to 9 pounds per beater. This completely eliminated the specks and the foam lost its blue color and became white. The size was then cut out altogether and the speck became more noticeable and troublesome. It was found that an old type acid color was being used.

After a careful study this trouble was analysed as follows: Some foreign material which recently came into the stock either due to change in water conditions or in general stock conditions was acting as a mordant for the dye. This material had a greater affinity for the dye than had the fibres of the stock. This foreign material was absorbing the maximum amount of dye of which it was capable in accord with the principle of color chemistry. This amount was not equal to the total amount of dye added to the beaters and hence some of the dye was being used to tint the paper. These color spots were collecting in the foam and breaking away into the sheet to form the specks. Size was the only agent which would aid the trouble and unfortunately it could not be used as a crepeing tissue was being made.

The trouble was eliminated by a change in the type of dye. Reference to Sutermeisters' "Chemistry of Pulp & Paper Making" gives the following concerning this particular dye:

> "It can be mixed with others to produce compound shades but is not suitable for unsized papers, as it has comparatively little affinity for fibres. Rosin size is essential for good results, especially for tinting and better fixation is obtained if the color is added long enough before the size to insure its thorough mixing before the latter is added."

This explains why the addition of the color before the size and alum somewhat aided conditions. However, the trouble was not completely eliminated due to the fact that limited beater capacity necessitated insufficient beating.

On one occasion a mill complained that they were unable to size their insulating board satisfactorily. In looking over their methods of manufacture several factors were discovered which we believed were detrimental to efficient sizing, such as, hot and acid stock. The temperature of the stock where the rosin size emulsion was added was found to be approximately 180 deg. F. From past experience it has been shown that the stock should not be over 110 deg. F. to obtain the best sizing results.

Acid stock is another factor which is detrimental to sizing. In looking over the results obtained on various runs, it was found that the quantities of rosin size used varied anywhere from 0.8 per cent to 1.5 per cent dry rosin, based on the weight of bone dry stock treated. These quantities of rosin were not sufficient to give a well sized board, so all of the following tests were made using 2 per cent dry rosin.

The first run was made under regular operating conditions, except that the rosin was increased to 2 per cent. The board obtained under these conditions showed practically no sizing. The second run was made under the same conditions as the first, except that the temperature of the stock was cut from 180 deg. to 105 deg. F. This change did not materially improve the sizing qualities of the board. The third run was made with cold stock that had been neutralizing with caustic soda. The finished product was still unsized.

After obtaining no promising results from the above tests, we decided that the moisture content of the board was the next factor to be taken into consideration. The moisture content of the board was found to vary considerably but the final product usually carried from 9 to 12 per cent moisture. This was cut to 5 per cent and the board was still unsized. On being placed in a vertical position in a vessel of water, it was noted that the central portion of the board became dark immediately and bubbles began to rise to the surface. From this phenomenon it was concluded that practically all of the moisture was concentrated in the center of the sheet. Several small samples of the board were placed in a laboratory oven and dried at approximately 280 deg. F. These samples on being immersed in water were found to be sized satisfactorily. The longer the board was exposed to the heat after becoming practically bone dry, the poorer the sizing. The best sizing or water resistance was obtained with the board containing ½ per cent moisture.

The main factor in this mill's method of operation which was detrimental to sizing was the drying, but the other factors listed above, such as, heat and acidity, were also detrimental, but their effects in the tests that were conducted were overcome by the fact that no sizing qualities were obtained due to the high moisture content of the board.

Another mill complained that something was wrong with the rosin size as some foreign material was found collecting in the top liner chest and the cylinder vats of the top liner of their board machine. The material was slightly jelly-like, amorphous, semi-transparent, pea-shaped substance very similar to a gray, cooked tapioca. Its odor was nauseating and putrescent.

Examination of this material by several laboratories proved it to be gelatinized starch, resulting from the complex reaction at elevated temperatures of the starch used in the furnish with a glue and gum present on the gummed kraft cuttings, which was used as a part of the furnish. This material was building up on small particles of stock and foreign materials in the liner vats, and due to the swirling, eddying, and rolling actions of the cylinders being formed into the pea-shaped balls.

Effect of Calendering

Again we had an instance where a mill was unable to satisfactorily size a rather high grade sheet of board. The board was being run with four water boxes on the first stack, two on each side of the sheet. The water in these boxes was quite cold, which was very satisfactory, i. e., hot water has a tendency to decrease the sizing of the board. The sheet passed through four nips in the first stack and through eight nips in the second stack, Nos. 5 and 6 rolls in the second stack being heated with approximately 10 pounds of steam.

The board coming from the driers was sized satisfactorily, but after passing through the calender stacks, the sizing was decreased very materially. Therefore, it was decided to make various changes at the stacks in order to minimize the detrimental effects which were produced at the stacks.

The number of water boxes was decreased first to two and then none with the result that the water absorption was only reduced about 13 per cent. This test indicated that the weight of the rolls and the water were both affecting the sizing, but that the stacks (weigh of rolls) were more of a factor in decreasing the sizing of the board than the water. Of course, the finish on the board was very poor when no water was used on the stacks.

Samples of board were taken between the two stacks with both two and four boxes on the first stack and were found to be sized almost as hard as the board coming off the driers. This test indicated that most of the destructive work on the sizing was being done by the weight of the rolls in the second stack. The caliper of the board was being reduced approximately 26.5 per cent by the stacks, which means that general structure of the board was being materially changed. The number of nips in the second stack was then reduced from eight to six (four boxes on the first stack) and this reduced the water absorption. Two more nips were then cut out and the water absorption was only slightly higher than that on the sheet taken off the driers. This test proved that the weight of the rolls in the second stack was undoubtedly the main factor causing the drop in the sizing of the board. However, the board produced under these conditions was satisfactory as regards caliper, but was considerably underweight and had a very poor finish.

Various other tests were made, such as, changing the water boxes from one stack to the other, etc., but no beneficial results were obtained. From the results obtained during this test it seemed only logical to assume that there are two ways in which it would be possible to decrease the water absorption of the board. First, by decreasing the weight in the second stack, thereby low-

ering the finish and weight of the finished board which is impracticable and second, by beating the stock longer, which should give a more compact board coming off the driers. By doing this it should be possible to decrease the weight or number of nips in the second stack, or if the weight is not decreased, it should not have such a detrimental effect, as the stacks would not have to do so much work on the board to press it down to the proper caliper and still maintain the standard weight.

On the next run the stock was beaten longer and the resultant board had considerably lower absorption test than that made on the previous runs.

Now we will pass on to an instance where a board mill was unable to obtain uniform sizing. They had two machines making the same product, using the same amount of size, same furnish, etc. Each set was tested for water penetration and first one machine would have good sizing and the other poor sizing and vice versa.

Their operating conditions were checked very carefully and a number of them were found to be objectionable but nothing was radically wrong. The number of weigh sheets from each set was increased from one to three, i.e., a sample was taken from the front center and back of the roll. The result was that perhaps the front would fail in ten minutes and the center and back would stand up for hours.

A close examination of the sheet showed sand and pin holes in the cases of the failures. On examining the filler stock at the Jordans, it was found to be full of dirt. The liner was raised a point from 3½ to 4½ and the board was sized satisfactorily. This was simply a question of cleaning up the stock and increasing the thickness of the liner in this case merely increased the factor of safety against the detrimental effects produced by the sand, etc.

From the above discussion of actual problems which have been encountered in paper mills and of the various factors which affect sizing, one can readily see that the question of sizing is more or less complicated and should be given careful consideration at all times.

Advance of the Modern Paper Machine*

By G. A. Macklem[1]

What is a modern paper machine, and what is a paper machine? The first paper machines of which we have authentic knowledge were used several thousand years ago and were what the Egyptians termed flails or, commonly speaking, paddles. They would gather the papyrus from the River Nile and beat it into a pulpy mass by these flails, place the pulp mass between cloths, roll it as evenly as possible, and leave it in the sun until it was dry. This was the paper machine of that day. Next came the box which was used by the paper maker into which to pour the paper stock. The collapsible sides and wire cloth bottom give the box a peculiar tilt which of course was the forerunner of our present day shaking arrangement that was developed in the machine which bears the name of the inventor, Fourdrinier. This picture illustrates in a small way the machine that was worked out by Byron Donkin and the Fourdrinier brothers. The advantage this idea possessed was that it embodied to some degree the peculiar twist which was given to the box by the paper maker when making good hand papers.

About the same time or possibly a little earlier it was found that a cylinder covered with fine wire cloth revolving slowly in a box, the water from the paper stock rushing through the wire cloth face on the cylinder, left a deposit of pulp on the face of the cylinder, which required a piece of wool cloth woven loosely to pick the paper from the cylinder and carry it away in a continuous web. This type of machine was invented by John Dickinson of England in 1809. It was improved and patented in this country by Thomas Gilpin in 1816. Gilpin had mills in Wilmington, Delaware. His machine had one cylinder and is said to be the first paper making machine of any kind in this country to form and make a continuous web of paper. We are told Gilpin sent a sample of paper to the Philosophical Society of Philadelphia which he described as writing paper of excellent quality taken from a sheet of paper 1000 feet long and 27 inches wide, the most remarkable feat performed in the manufacture of paper in this country up to that time. Thus you can see the cylinder machine also embodied the important points of the hand paper maker, wire cloths and woolen cloths which they termed cloths for felting the papers, today commonly called felts.

Drying of Paper

At that time the paper was dried by passing around a cast iron cylinder supported in grindstone type of bearings, each end of the cylinder open. A grate stretched across and inside the cylinder served to build a wood fire inside the dryer; a chimney was arranged back of the dryer to carry away the smoke and give a draft to the burning wood inside the dryer. It was necessary to watch this cylinder for if it became too hot it would burn the paper passing around it. Thus as the fire became hot a man regulating was supposed to speed up the machine or if the fire began to get low he must in turn slow the machine down; the speed of the machine was governed by the fire inside the dryer. Later it was decided to try steam heated dryers, first three, later increased to five, but this was to be the greatest number as any more would ruin the paper.

The paper machine moved along quietly for a number of years, the cylinder type taking care of the straw and paste boards, the fourdrinier type taking care of the news and book grades, with very fine papers made by hand. The fourdrinier could make straw but the lime would plug the wire. A large Philadelphia daily newspaper was made of bleached straw for a period, but the advent of wood pulps was a reason for the industry looking itself over, which always causes the engineers to do the same, with the result that machines designed during the period between 1880 and 1890 received more dryers. As many as ten were placed in a single row; then it was decided to place small driers in upper deck. Some of our friends placed 48 inch driers in bottom row and 36 inch driers in upper row. I have seen machine with 36 inch driers in bottom row and 28 inch driers in upper row, until one, more bold than others, decided to try 48 inch driers in bottom row and 48 inch driers in top row and, strange as it may seem, they worked.

The Head Box

This was the means of the paper makers' asking for more speed and the engineer again tackled the problem. Twenty-four feet had been the length of the wire, then 32 feet, then 40 feet, but that made quite a long wire; then 45 feet, then 50 foot wire, and by this time machines were running as fast as 200 feet per minute. About this time, during the late 80's and early 90's, another era set in. Gas was found in Indiana and Ohio. This started the upward trend of cylinder machines. Everybody in Southern Indiana, Illinois, and Ohio wanted to build straw mills. As the gas failed, many of the mills failed with it, but a few pulled through. This was made possible by rebuilding them and making them run twice as fast as they had before. By the early 90's the fourdrinier machines were running up toward 300 feet per minute on newspaper and the cylinder machines were running about 50 feet per minute on straw and what was termed in those days as paste board. It was about this period when we began building

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 7, 1929.

[1] Member TAPPI; Vice President, Beloit Iron Works, Beloit, Wis.

toward the modern paper machine. In those days the head box was a standard small receiving box to take the paper from the screens and deliver it to the wire.

The head box of today is given very careful study; it must have the curves exactly correct to apply to the kind of paper desired. It is either lined with copper or built of stainless steel with mixing rolls placed at points where they will send the stock to the wire at the correct speed. The apron board must be of heavy cast iron lined with brass so that the apron will not cause eddies or hydraulic curves, which were caused by the uneven wooden board when speed was attempted. We have the high Voith slice which gives head enough to bring the stock to the wire at the proper speed, so the speed of wire and speed of stock will go together at the same speed. If the wire is running slower than the stock, a film will be formed on the wire and the loose stock will either wave or curve as the wire runs away from the stock. In the machine of thirty years ago a question of this kind would never occur, but today this is vital.

Increasing Speed

When the speeds were 400 feet or less the bell crank shake was sufficient running at 125 strokes per minute. Today the same sheet to be run at 800 feet per minute requires a very sensitive movement on the shake and if a speed of 800 feet is required on either a sulphite or kraft sheet, we support the wire part entirely on springs, arrange a shake that can be run as high as 400 strokes per minute if desired. The shake and fourdrinier part are made adjustable so the paper maker can watch the formation of the sheet, raise and lower the fourdrinier, and adjust the speed of the shake until your formation is just what you want. As you speed the machine you adjust these two points in unison. This is the modern fourdrinier end.

To permit this high speed of the fourdrinier part, the table rolls must be light. We make them of aluminum. Water will wash the surface of aluminum, thus casing the surface to pit. To overcome this we cover the aluminum with either a sleeve of rubber or a thin brass sleeve; thus you get a non-corrosive surface to the rolls, also a very light table that will easily stand the high speed of the shake. The weight of the table rolls and breast roll with rails and shaking parts of a 154 inch wide machine built in 1910 is about 15,000 pounds, whereas the weight of the table rolls and breast roll with rails and shaking parts of a similar machine built in 1927 is 5,000 pounds. This permits speed in movement which cannot be attained by the older method.

The Modern Paper Machine

You are, of course, familiar with the oscillating suction boxes, the removable fourdrinier, the high speed suction couch in anti-friction bearings, high speed suction presses, and sometimes a second suction press, driers bored inside, turned and finished under steam pressure, supported in Timken bearings and driven by a chain, calenders supported in Timkens, reel and winder the same. The success of the modern paper machine means more detail than anyone could have dreamed about a few years ago. Today the table roll tube must first be straightened and given a static balance. Then when the heads are fitted and the cover applied it must receive what we call a running balance to the speed it must ultimately run. In comparison with a few years ago, we now receive the aluminum tube, straighten it, balance it, solder the heads in, put it in a lathe and turn it true, then cover same with either a rubber sleeve or a thin brass tube pulled on tight by a press, then dies drawn over which makes the tube hug tight to the aluminum roll, straighten again and carefully balance, then fit the Timkens to the journals; give the roll a running balance in its bearings to the speed it is intended to run, then ship it supported on its bearings with a cushion support in the center. Compare this with purchasing brass tubes, casting brass heads, sweating them in the tubes, supporting the roll in centers, straightening the tube, giving it an approximate balance, turning the journals straight, dropping it in a box and shipping it lying full length body on bottom of box, same along sides of box.

This is the beginning of the difference between a paper machine of a few years ago and the modern paper machine. A few years ago a suction box was a brass casting with rubber heads and wooden cover. Today the box is stainless steel or aluminum, it must be light and strong, it is beyond the possibilities of a cast brass box. This box must be moving under the wire so the wire cannot groove the covers; also with the number of boxes used today the wire would be inclined to freeze to the covers and would increase the power and decrease the life of the wire. Thus we must oscillate the boxes under the wire to keep the covers smooth and thus permit higher speed at no greater danger to life of wire than when speeds were slow. We must separate the air from the water so that the mechanism creating the vacuum, whether pump or blower, must not have the water passing through same. The water is handled by a pump separately from a pump of some description, while the vacuum is constantly on the boxes from a machine that is only intended to furnish vacuum and not handle water.

Anti-Friction Bearings

The couch roll or the suction roll of a few years ago could run in plain simple bearings. Today the suction roll or the couch roll, as the case may be, must be in anti-friction bearings, small journals all arranged so they are very sensitive and suitable for high speed. The box inside of the suction roll must be arranged at this high speed so that there will be no more friction inside the suction roll shell at 26 inches of vacuum than there is at 1 inch of vacuum. This can only be attained by a balanced joint inside the suction couch roll, as by the older method the box was pulled so tight against the inside of the roll that when running high speed it created a great amount of friction, increased the horse power on the drive, also in a very short time cut the inside of the shell very badly; thus again what was well suited a few years ago on the speeds of that day is not suited for the modern paper machine at high speed.

The Removable Wet End

Of course you are all familiar with the removable and adjustable fourdrinier, thus I will not attempt to go into any details of that, simply say that the modern paper machine expects this arrangement, as it would not do to handle high speed rolls by removing them from the machine, moving them back again, disturbing the bearings, taking a chance on injuring the body of the table roll or the wire carrying roll; thus this becomes a fixed point in the new modern machine. I do not believe that the saving in time or the saving in labor is the only point gained by the removable fourdrinier. I believe the most important point is the protection of the rolls that come in contact with the wire and the protection of the bearings on these rolls so that when they have once adjusted themselves they are not disturbed any more. These points are very important and lend largely to the life of the wire, which is much more important than the saving of several hours in installing a wire and the saving of the time of possibly ten or fifteen men while installing the wire. Although all of these points are important, I believe the disturbing of the rolls on the wire part during this transaction is the most important point.

A few years ago we thought of the book and bond machine in terms of low speed. Today we must class them with high speed machines. This also applies to the modern kraft machine. It must be placed with the high speed machines as the high speed shake has improved the formation of this class of paper to such a degree that instead of considering same as low speed products, they must be classed today as high speed products and are thought of in terms of from 500 to 1,000 feet per minute. This has been brought about by the improved method of leading the paper to the breast roll and forming the paper after it arrives on the wire by the new improved high speed shaking arrangement.

Another point about the modern paper machine is that a few years ago men had to handle the wire with the greatest amount of care while it was being installed. Everyone must be careful in handling same not to get any kinks or any marks on the wire.

The modern paper machine does not permit anybody to touch the wire. By simply adjusting a screw on the back, the front of the suction roll is raised, a small aluminum block moved out of the way, a carriage carries the wire around the suction roll, small aluminum wheels attached to the wooden rollers that come with the wire unwind it, thus there is no occasion for the man to touch the wire while it is being installed, as the wire is merely unrolled from the rollers which are furnished by the wire works. The width or the weight of the wire makes no difference; one wire is as easy to install as another, as it is all a mechanical problem and not left to the human element in the modern paper machine of today.

The Press Section

The press section has changed. The press rolls of today are supported in anti-friction bearings, all arranged to keep water from the bearings, thus they need no more attention than the bearings of your automobile and my belief is that most of you do not know that an automobile has bearings from the standpoint of the care that you must give them. This applies to the felt rolls on the press section, in fact the aim of the builder of the paper machine is to try to build this press section so that the paper maker need only think of the manufacturing of his paper and need not be a machinist that is continually trying to build and fix his machinery, as he will either be a good man in one line or the other and our experience has been that the paper men very much prefer a paper maker rather than a machinist working on his machine. Thus the modern paper machine is built with the thought in mind that it will run without any attention, except possibly a man with a pump once a month to put a little bit of grease around the anti-friction bearings.

The modern paper machine builder must still cover his rolls with rubber or gun metal, but this has also become a science. Today the first thing the builder wants to know is what class of paper is to be made. Then he must arrive at a proper density and a proper mixture to make the cover do the best work on that class of paper. We all know today that a roll covered suitable for writing and fine papers at moderate speeds would not be in any way suitable for newspaper at high speeds or kraft or other grades at high speeds; in fact, each grade of paper and the details that must be performed in turning out that grade of paper must be studied carefully before the builder fully determines the grade of rubber that must be used on the rolls in the paper machine. A few years ago we had soft rubber and we had hard rubber. The hard rubber was put on for safety when we did not want it to corrugate, neither did we want any complaints and the purchaser was not willing to accept iron or brass rolls. He would accept hard rubber, which at least made everybody's conscience clear, although it could not be any easier on the felt than brass or iron would have been, but he had the satisfaction of knowing it was rubber and would not corrugate. The other grades would corrugate and had to be ground frequently, but were the best we knew at that time; thus in the modern paper machine the rolls must be covered with rubber suitable for the grades of paper that the customer expects to make on that machine, that coupled with the speed he expects to attain on that grade of paper.

The Drier Section

The modern paper machine has made a long step from the drying arrangement of a few years ago. I have mentioned this in my preliminaries, thus we might step over the preliminaries and go right into the actual conditions on the paper machine. On the machine of a few years ago the driers were turned and a man with a board and a piece of emery stone polished the surface of these driers. A little while later the driers were polished with a wheel that would float back and forward to suit the irregularities of the drier. Today the modern paper machine demands something entirely different from that. First the drier is rough turned, then permitted to season just as long as possible before finishing, then it is bored carefully inside; the heads are applied; the drier is then turned under steam pressure as near as possible to the pressure of steam at the mill when the drier is actually in operation. It is then set aside to cool, then placed in a grinder and ground under steam pressure just as carefully as we grind a press roll. This was not considered essential a few years ago but today is a very important point in the present day paper machine for if the drier is not finished properly, the paper maker will never get the proper finish on his paper and the proper draws in the machine when running the machine at high speed. When these points are carried out very carefully, the machine will run steady, the draws will not fluctuate as they did on the machine of a few years ago. Thus I have known machines running over 1,000 feet per minute that have run over a day, and have heard of them running for over two days, without a break in the paper. The producing qualities, after all, prove the real value of the machine, thus the modern machine at high speed, when properly built and all of these points properly embodied in the machine, should run more safely than the machine of a few years ago even though the speeds may be 100 per cent or greater than the speed of the machine of a few years ago.

The bearings on the dryers of the Modern Paper Machine have changed. A few years ago we preferred a chunck of suet for lubrication as we felt sure that the journal would always have some grease. It would never get dry. Then we passed through several stages of oiling, but on the paper machine of today the drier is supported entirely in tightly concealed collar oiling bearings or anti-friction bearings tightly concealed, with oil circulating through these bearings out to a filter and to a cooler with a pump return; in other words, a complete circulation of moderately cool oil is passing through these bearings at all times whether they are collar oiling or whether they are anti-friction bearings as we have found from experience that grease on a hot bearing will either melt and run out or is apt to carbon and thus make trouble. Thus the circulation of oil through the modern drier bearing is, we believe, the latest and very best method of lubricating the drier jornal, decreasing the power for driving the driers. The felt rolls are also supported in anti-friction bearings but these can be lubricated by a fine grade of grease as they never get hot; thus the man with a gun must give them some grease occasionally, possibly once a month.

Felt Stretchers

The stretchers today are automatic. Simply apply the amount of weight that you want to apply to the felts and do not depend on the judgment of the machine help as to how many revolutions of the screws are necessary to give the amount of stretch desired. The guides are automatic. In fact, everything on the modern paper machine has been done to allow the paper maker to devote his thoughts and energies to making paper and not force him to try to be a machinist and an oiler, as well as a paper maker. His problem is, and should be to make good paper, and a high quality in the particular class of paper that is being manufactured on the machine.

Of course the modern paper machine has no drier gears, is driven by a chain which is always passing through oil, needs no attention, and makes no noise. The back of the machine is as convenient for the operator as the front except that he must go around his steam pipes, but he does not have to take into consideration any drier gears.

It might interest you to know that the casting of a drier for the up-to-date paper machine is a very different process from the casting of the drier of a few years ago. The mixture of the sand, the mixture of the iron, the heat of the iron before being poured, all of these points are carefully worked out by the chemist today and before the drier is poured the superintendent or manager is over the ladle to make sure that the metal is exactly the right temperature before pouring. The drier must be arranged so that the metal passing down between the two layers of sand must not touch the sand as the paper machine driers must have no sand and no dirt spots in them. In fact, the foundry has stepped very deeply into the laboratory of the chemist. Who knows but that the moulder of tomorrow will have a diploma in chemistry before

he can take a job in the foundry making driers and rolls for the paper machine?

Calenders

The calenders of a few years ago were in plain babbitted bearings. Water passed around the bearings to keep them cool, but the engineer building the paper machine discovered long ago that water around the calender bearings is only intended to protect a defective bearing; thus when we step up in speed, the bearing must be made correctly as the water failed to do the work after the machine passed a certain point in speed and production. Today the calender is supported in either close fitting collar oiling bearings or anti-friction bearings, all under a circulating pump and filter.

The preparing of the calender roll is a problem. A few years ago a calender roll was iron poured into a shell. The shell hardened the surface, the roll was turned and ground, and that settled the matter. Today the iron is carefully selected, carefully mixed by the chemist. The pyrometer plays a very important part in the preparing of the metal. All of these points must be studied very carefully before the iron is ready to pour into the mould. Then each roll must be equal to a certain amount of hardness. This is tested by a scleroscope, which in turn must show an approximate hardness of 70 before the rolls are right. The rolls in the paper machine are usually much larger, much longer, and much more difficult to handle, thus the preparing of the calender roll has developed into a special science which has been worked out very successfully, but at the same time very different from the preparing of the calender roll of the paper machine of a few years ago.

The doctors of today are special and must have an automatic device which either electrically or hydraulically moves them away from the rolls while they are running as the tremendous speed of the rolls with the doctor running against them today would cause them to get hot in a very short time. This makes the roll change shape. When that occurs, the paper maker must spoil his doctors to heat other parts of the roll to make them correspond with the parts that are already heated, thus spoiling the doctors and injuring the rolls; whereas by simply touching a button or turning a handle the doctors are moved from the rolls, the rolls warm equally all the way across and are not influenced by the doctors hanging against them. Also the lifting of the rolls must be done with electric or hydraulic movement as the modern paper machine has reached to a point where hand power cannot be applied. All of these points must be taken care of automatically by machinery. The real is semi-automatic, must wind the paper up to a given amount, then as the next spool is building up the full roll is automatically unloaded, thus again doing away with the human element at this point. The winders of today are many, but are all worked out with one thought in mind: good rolls of paper, high speed, safe performance, and arranged to automatically discharge the rolls of paper.

On the modern winder when the paper is passed through by moving a handle the slitters are all thrown out of mesh, simply leaving the trimmers on the edge to trim the paper to the proper total width. When the paper is started on the winding shaft, a movement of the handle again throws the slitters in mesh, thus everything is handled safely and yet the paper is given a good clean edge, as the paper maker well knows that if the edge is left ragged or dusty he is sure to hear from the printer, which in turn sends him back to the builder. Thus we are all working together with one thought in mind: to prepare the paper, the magazine, the book, or whatever form of paper is received by the public, properly, cheaply, and better than it was ever prepared before.

Of course the winder and reel are both fully equipped with anti-friction bearings as the days of the old oil bearings have passed. Everything must be automatic so that the paper maker need only give his attention to the preparing and handling of the paper.

The driving arrangements are usually prepared to meet the needs of the special paper machine on which they are going to be applied. The electric drive has worked out successfully on high speed news machines and on others, also, but there is a tendency on the part of the paper maker to want a simple drive where he changes speeds, changes weights, which in turn changes his draws and helps him obviate weakening his paper by undue stretch. This has been met by the builder with a special drive of spiral gears which are encased in a bath of oil. The teeth of the gears are hardened, everything is supported in anti-friction bearings, everything is quiet. This arrangement is equipped with a high speed clutch similar in many respects to the high speed clutch on your automobile. It is all noiseless. There is no place for the oiler or the cleaner as everything is concealed and everything runs in a bath of oil. The clutch is operated by hydraulic pressure. A valve on the front of the machine throws it in or out. The belt shifter is operated by a motor from the front of the machine, thus the machine tender can stand with his finger on the paper, judging the tension and quietly moving the belt a little slower or a little faster as his judgment may determine is best. This is all very simple, adapted to high speeds and, as previously stated, is not the only drive but is surely the drive that the paper maker is preferring at the moment. The proof of this is in line with President Lincoln's remarks when he said, "God must have loved the common people or he would not have made so many of them." The paper maker must love the spiral bevel gear drives or he would not be installing so many of them at this time.

In discussing the fourdrinier machine of course the same care is carried into the yankee, which is a fourdrinier, but this type of machine is becoming more popular all the time as it prepares the sheet in a special manner, makes it better adapted to purposes for which the ordinary fourdrinier sheet is not adapted. The yankee presents a problem of its own.

The Cylinder Machine

The cylinder machine has advanced with the fourdrinier but the same care in preparing the rolls, preparing the bearings, preparing the journals has been carried into the cylinder machine with the result that whereas the original cylinder machine was equipped with a cylinder mould, two presses, and five driers, today the modern cylinder machine will run anywhere from five to ten cylinder moulds. It will run between 300 and 400 feet per minute, making board in proportion, but of course this is a very different machine from what was used a few years ago. The cylinder moulds, couch rolls, squeeze rolls, primary press rolls, press rolls, the felt rolls are all supported in anti-friction bearings. The first essential of course in running fast is to get the machinery exactly right. Otherwise you will be troubled with air streaks. The engineer has tried to overcome that by building the vats in a special manner and preparing the leads to and from the machine in a special manner. The pumps must be built special. Everything must be arranged to obviate air and retain the proper mixture in the material. Thus on the liners the test will be high. On the filler the test will be good. The combination will give tests today at 300 feet that were unthought of ten years ago at 50 feet.

A few years ago everything about the cylinder machine had to be arranged good and loose so plenty of grease could be used. Today we figure the journals, bearings in thousandths. We allow so many thousandths leeway in the journals and fits of the various rolls and their bearings entering into the cylinder machine Thus must all be carried out to prevent crushing, to prevent air streaks, to prevent the layers moving and thus of course ruining the paper. The engineer has assisted the paper maker to a point where today the cylinder machines run safely from 300 to 350 feet per minute. He has also assisted him to a production in proportion.

The driers must be carefully supported in concealed bearings running under oil circulation, the calenders in concealed bearings with oil circulation, with improved reels, improved winders, everything in line with the fourdrinier improvements, to build up the board machine. The concealed drives apply here and are more important on this type of machine than on the fourdrinier as you can get a very great range out of the new type of drive whereas it was necessary to back gear with the old type of drive. Thus the advance of the board machine from a few years ago to the modern machines of today means from 50 to 350 feet per minute and from 30 tons to 200 tons and over per day.

Wood Handling for Pulp Mills*

By G. L. M. Hellstrom[1]

The method of dealing with the wood or timber in the forest and transporting same to the mill can of course be attended to in different ways, and depends largely on local conditions, but almost everywhere it can be improved on.

In Europe, as you probably know, experiments have been made by completely barking the wood in the forest, if this is done at the right time, it proves to be the best plan for saving wood.

Where no river for floating is available, the wood has to be transported by rails, trucks, aerial-cableways or steamers. You will find it advisable to consult an expert and that a specialist can give very valuable advice as to how to obtain savings in the cost of transportation.

For instance, the installation of an aerial-cableway may mean great savings compared to transportation by trucks and a better way of loading and unloading the wood may reduce the cost of the wood delivered at the mill considerably, and make it well worth while consulting a firm with experience in such matters.

At mills on this continent, the wood is, as you know, usually stored in piles. In Europe, on the other hand, it is stored in more regular stacks. The method of stacking the wood has been greatly improved on during the last year and great savings in labor and space have been accomplished, through stacking bundles of wood. In most cases longer wood than the 4 foot wood now usually used would simplify matters in the initial stage and when transporting the wood,—especially in connection with sulphite or chemical mills where there is a question of making chips and where it would result in a more efficient handling and saving in wood.

One great advantage in stacking the wood, especially in sulphite, sulphate or soda pulp mills, is that the wood gets better and more evenly seasoned. Through this it is possible to produce the highest quality of pulp and to get the highest possible yield. By seasoning or drying the wood, savings will be obtained in the acid plant in the sulphite mill or in the soda recovery plant in sulphate or soda mills; steam will also be saved.

Another important advantage is that the wood can be efficiently barked, and instead of having the trouble and expense of disposing of wet bark, the dry bark can easily be blown direct to the boilers from the barking equipment, and you can get the full benefit of its fuel value.

It is claimed as a disadvantage of this method of stacking the wood that more labor is required, but by using up-to-date equipment which, as a matter of fact, costs considerably less than the ordinary equipment now used for piling the wood, you will not require more labor but rather less than what is used for piling, calculating of course on a full year's work in a mill.

In Europe, cable cranes are usually used for stacking the wood and for each such unit, as a rule, two men are needed: one to manoeuvre the crane and one to take care of the bundles when stacking the wood. The wood can conveniently be taken by crane either direct from railway cars, trucks or out of the river, without waste of labor. Fifty to one hundred logs may be handled and stacked at a time and by the same number of men, and can be conveyed to the mill by the same equipment.

You will note that by this arrangement there will be no damage to the wood such as occurs, for instance, during the winter, when the wood has to be blown loose or is dropped from a considerable height when piling. You have no doubt noticed that a great number of logs have been damaged through this system of piling. Furthermore, you will notice from the foregoing that although the stacking may take a man or so more, labor is saved when transporting the wood from the trucks or from the river, and the great number of men which are often required to take the wood from the pile to the mill will never be required by using this system.

Barking Wood

At the mill, the wood is either barked in barking drums, or what may be called friction barking, or by disc barking machines. For a news mill, it is often considered satisfactory to use friction barking only, but when it comes to making high quality pulp and obtaining the highest possible yield, it is found necessary to do a great deal of barking where friction barkers are used. This is done either by hand or by disc barkers. Incidentally, it is of course most desirable to obtain the best quality and highest possible yield even in a news mill and it will, therefore, pay to always take better care of the wood.

Some of the factors to be considered when deciding on barking equipment are: the loss of wood, first cost of the installation, labor required, cost of handling the bark and the use of same. Furthermore, consideration must be given to what cleaner wood will mean to a mill in saving in the cooking process; less screening, screening equipment, power, etc. It is difficult to determine and obtain comparisons on the actual loss of wood during the barking process, as this so much depends on local conditions, variation in wood quality, transportation, etc. It may be of interest to you to know that one news mill making its own ground wood as well as sulphite, where careful investigations were made using, in one case, only barking drums and, in the other case, disc barking machines, it was found that the last method had distinct advantages; they saved power, etc., and obtained cleaner pulp of higher quality.

From tests made with the latest type of disc barking machines, the actual loss of wood has proved to be not more than 6 percent on an average. Considering all that is lost by friction barking, especially if in connection with same the old type of disc barking machine is used for after-barking, it will be found that the loss of wood is considerably higher, in addition to loss in screening, power, etc.

One mill where six of the machines are installed, handling 300 to 400 cords of wood per day, use only two men per shift. These two men sit some distance from the machines and regulate them. This, of course, necessitates automatic feeding arrangement, etc., and, therefore, in most cases it will be found advantageous to have one man for each machine. A very simple automatic transport arrangement can be made for conveying the wood to the disc barking machines and to the chippers.

For the best results with these barking machines as well as the chippers, and to save loss in wood, it is desirable to use, as previously mentioned long wood. 8-foot wood will prove an ideal length to handle and, of course, means half the number of logs to handle compared with 4-foot logs. Longer logs are also better for the chippers as they will lay steadier in the chipper spout and there will also be less loss in sawdust in the slasher.

Chippers

The importance of the design of the chipper and its attendance can never be emphasized enough. After long experience and a great deal of research work a chipper has now been designed, as illustrated herewith, which will produce uniform chips with a minimum loss of sawdust and waste. From tests made, the loss of sawdust has been found to be less than ½ percent.

We have been told that one kraft pulp and paper mill which recently installed chippers of this type found that they could produce such uniform chips that it was not even necessary to

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 6, 1929.

[1] Paper Machinery, Ltd., Montreal, P. Q.

screen them only the small percentage of sawdust produced was removed as considered of no value for paper making.

This chipper is made in three sizes with 87, 110 and 120 inches with disc of solid cast steel. The chipper spout has such an angle that the wood lays steady. To obtain this result a full sized model was made with different angles, and careful experiments were made to determine which gave the best result both as regards quality of chips produced and power consumption. Particular care has been taken of the fittings of the chipper, and that the distance between the bed knives and the chipper knives is reduced to a minimum. An arrangement is also made for conveniently adjusting and changing the knives as they wear out.

These chippers run at a lower speed than as a rule has been usual. For instance, the 110 inch disc chippers only run about 150 r.p.m.

This recently improved type of chipper has not yet been installed on this continent, but similar types are in operation in different mills.

Not Yet Installed Here

A chipper carefully operated should of course make a clean cut and not "chop" the wood, close up the ends of the wood or make slivers and sawdust as many chippers do. The loss may often run to several percentages and you can easily see that if, for instance, your wood cost runs into a million dollars, it is evidently worth while to promptly replace an unsuitable chipper. The best chipper is soon repaid by the many advantages obtained, including the value of making good chips. All paper-makers agree on the great importance of uniform and good chips, and about the disadvantages of cooking slivers, sawdust and other unsuitable material.

The chips can either be conveyed from the chipper by a belt conveyor or the like, or be blown by small wings on the chipper disc to the desired place. Lately, it has been found that although the blowing action takes slightly more power, it is just sufficient to break up the chip cakes without producing sawdust, and make the chips suitable to be taken care of by the chip screen. If the chips are not blown, it is advisable to install a disintegrator or chip crusher which is arranged for just sufficient action to break up the chip cakes and make them suitable to be handled by the screens. If this is not done, as will be found the case in many mills, a great percentage of the chips or chip cakes will be rejected by the screen, and in addition to giving the screens more work will, after being passed back as rejects to a crusher or re-chipper, be treated so severely that they will not longer be first-class chips. A re-chipper or crusher for handling rejects is not at all a suitable apparatus for producing high quality chips and only when absolutely necessary should they be sent back to such an apparatus.

Rotary and Flat Types

Chip screens are both of rotary and flat types. The rotary screen has the advantage of being self-cleaning, and if properly designed and installed, will give very good service. As you will see from the illustration shown herewith the rotary chip screen will separate the sawdust, slivers and the good chips in an efficient manner. It is of course desirable that the chips from the re-chipper or crusher are taken back to a separate screen but, in a small mill, this might be found too expensive although we believe that in the long run it will pay.

Propeller Agitation *

By Arthur L. Whiteside[1]

It is the purpose of this paper to treat of propeller agitation in general, with a short discussion of the principle of the tubular agitator, its application to the pulp and paper industry, and to summarize the past and proposed development work in that field.

Propeller agitation can be most conveniently discussed in two classes, First, undirected agitation, where stirring or mixing is dependent entirely on the propeller itself, Second, controlled agitation, where mechanical means such as baffles, deflectors, dividing walls or special tank contours aid in directing the propeller flow.

Undirected Agitation

These devices are simple in construction and use. A propeller shaft projecting diagonally into the top of the tank; a propeller shaft mounted tangentially through the side of the tank; a vertical shaft, central or offset, with one or more propellers; two or more propeller shafts in one tank.

The simplicity of these arrangements is not meritorious. They are applicable to only the simplest conditions. A description of propeller action will make this clear.

The industrial use of a propeller is exactly the reverse of marine practice. The marine propeller is designed with a stream line cross section, intended to cut through the water with the least effort and disturbance, like a bolt being screwed through a stationary nut. Propulsion of the boat depends on the inertia of the water, its refusal to move.

A boat tied to the dock, under power is an illustration of agitation. The propeller attempts to pull a smooth stream of its own diameter through it. Skin friction of the fast moving column, banking against the dead wall of inert water, behind the propeller, short circuiting around the blades, all cause churning and turbulence. The action is a violent local disturbance.

A propeller in a tank does not act in just this way however, particularly in free flowing liquids. The propeller produces a flow at first if the tank is of such size that it will establish a circuit. Very quickly the effort that originally showed in turbulence goes into producing a circular flow which increases rapidly. This shows as a funnelling action on vertical shaft. On both vertical and horizontal drives the tank contents develop a heavy swirl that effectually prevents intermixing of upper and lower strata.

If the propeller and power input are small in respect to the volume of material to be mixed, and if the mixture is of sluggish, slow flowing consistency, this method of mixing is of no value as the swirling and propulsive effects die in a local area. Its use is only justified in stirring soluble ingredients.

Comparison With Paddle Agitators

Paddle agitation is very similar in action. Slow, ponderous arms or sweeps moving through a liquid cause a local disturbance. They will hold soluble materials in suspension with slight effort, but like the propeller have no means of inter-mixing the adjoining circulating strata of the mixture.

Materials to be mixed in either type must be introduced in such order or condition that they will go into suspension or solution at once. Heavy insoluble ingredients will stratify in the propeller type and will precipitate in the paddle type agitator.

Controlled Agitation

Patent office records show endless attempts to utilize the propeller for agitation. Propeller design has been thoroughly worked out. Unique combinations of proved propeller designs with baffles, deflectors or tank shapes have been made for specific applications and many are in use in industries to which they apply. Paints, glues, soaps, cotton solutions, etc., present special problems which

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 7, 1929.

[1] Hill Clutch Machine and Foundry Co.

the industry itself has had to solve. Usually such units are of necessity of small size, and chemical control is involved in the agitation process.

Of the few designs for general application none have met with widespread acceptance. Invariably they have found better application in one industry or process and have been modified for that work.

A basic principle is that all of the material must move. Various means of transmitting the propeller effect to the extreme limit of the tank have been worked out: Conical deflectors below the propeller wheel. Vertical baffles, circular baffles, spiral baffles opposing propellers to prevent swirl, enclosed wheels on the order of centrifugal pump housings to develop circulating streams.

That few of them have been successful in general applications to replace the paddle type is not proof that the principle is wrong. Considerations other than mechanical action may explain it. Complicated drives, cost of manufacturer, maintenance, slow action, power consumption, are features that must be right.

Our belief in the principle of propeller agitation is fundamental, it dates back at least thirty years to initial installations of that type, one of which is still running and will be described more fully later.

Experimental work has proceeded along very definite lines. The reasonable assumption was made that the power put into the propeller could be taken out effectively; that turbulence and churning and swirl could be put into useful effort; that violence is not a necessary feature of intermixing; that controlled circulation could be directed to all parts; that the bottom of the tank must be swept; that dead areas are disastrous.

These basic principles were worked out slowly in the redesign of our old marine propeller agitator.

Our development work three years ago centered on holding this perfection of the mix, within the time, within the power, and breaking up the bottom deposits.

The result is evidenced in a battery of twelve units which have now been in operation for a year in a new eastern plant. A single propeller located at the bottom of a 16 ft. diameter by 26 ft. deep tank, produces a heavy circulation of the mud, evidenced by a flow across the top of about 90 ft. per minute. The tank bottoms are clean and require no digging out. The uniformity is as perfect as their chemical control can check. The time element is less than operating conditions require. The power consumption is one-half to two-thirds that of competitive units of the paddle and compressed air type.

This new unit is designed as the Hill tubular agitator to distinguish it from the standard paddle types which we build for stock chest installation in the paper industry.

Hill Tubular Agitator

The accompanying diagrammatic sketch shows the unit in section. Arrows indicate the flow.

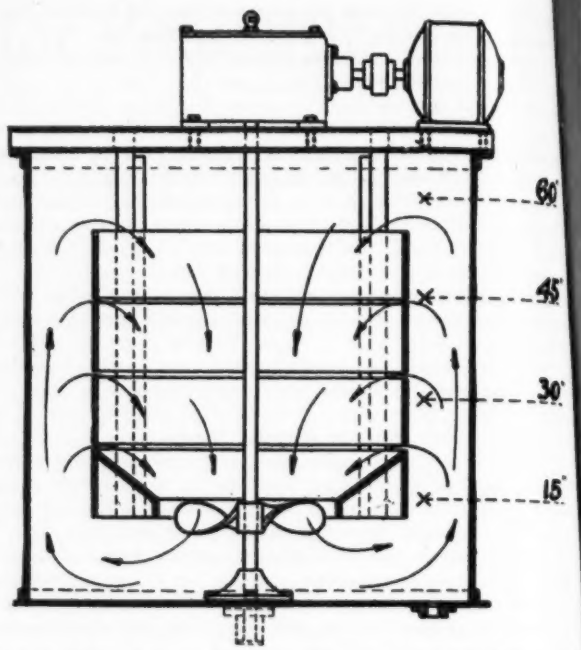
The tube is similar to an open bottom tank. Disregard for a moment the slots or openings in the tube. When the propeller starts it creates an unbalance in the two equal volumes (the volume inside and the volume outside the tube). This unbalance need be only sufficient to overcome the skin friction of the liquid against the tube and tank in order to start circulation vertically, upward outside, downward inside.

In a deep, small tank this circulation would continue indefinitely without appreciable intermixing except at the propeller. But the propeller is not the intermixing element.

Tube slots proportioned to the material and flow introduce a cross flow between the ascending and descending columns.

In consequence the entire volume of the tank is in circulation, slowly, positively, with the least expenditure of power. The constant cross flow through the slots gives thorough diffusion without undue volence or turbulence.

The tube throat confines the down flow to a smooth stream of the propeller diameter and so makes the impelling effort of the wheel fully effective. Advantage is taken of the centrifugal effect of an unconfined propeller by so locating it that its bottom edge is free to start centrifugal action.



The design of the throat and location of the propeller have been worked out by trial to effect a clean swept bottom by the combination of the downward drive and centrifugal sweep of the wheel. The swirl referred to in the discussion of unconfined wheels is dampened immediately by the wide leg angle baffles which are part of the structure carrying the tube sections.

When the tank is discharging, agitation by circulation is effective until the lowest slot is uncovered. Beyond that, agitation is effective by swirling until the propeller is uncovered.

In the course of our experimental work we have found that seven propeller diameters will meet any condition in tanks from ½ bbl. capacity to 20 ft. in diameter. A fixed speed for each size has been established to suit standard driving means by worm reductions, herringbone reductions, enclosed bevel gearing, Texrope, or open gears and belts.

DIFFUSION, HORSEPOWER AND FLOW

Samples trapped at	5½-inch pitch 1.18 h.p.		11-inch pitch 1.54 h.p.		17-inch pitch 2.13 h.p.	
	Oz.	Vel.	Oz.	Vel.	Oz.	Vel.
60-inch level	7	27	7	35	6¾	37
45-inch level	8	36	7¾	47	7½	51
30-inch level	8¾	84	8	118	7½	124
15-inch level	9	162	8¼	190	7¾	216
Bottom	8½	...	8	...	8¼	...

Mixture, 1,000 pounds sharp foundry sand, 500 gallons water. 100 per cent uniformity is 8 ounces per quart.
Diffusion is given in ounces of sand per quart of trapped sample.
Pitch indicates the various settings of the adjustable propeller.
Flow at various levels is in feet per minute, vertically.
Tank size, 54 inches diameter, 66 inches deep. Enclosed bevel gear drive. Propeller shaft speed 350 r.p.m. Propeller diameter, 18 inches.

The propeller has separate blades which can be adjusted and locked in the hub. Any one propeller can be set to effectively develop from 1/3 to 3 times the velocity for which it is normally designed without undue loss in efficiency.

The tubular agitator can be regulated to give that agitation which will load the motor 100 per cent or conversely the agitation desired can be determined and a motor chosen to suit.

The adjustable propeller has the advantage of flexibility. A large storage agitator with a large propeller set for low velocity to maintain suspension of the mix, can operate on lower power than a small batch mixer with a small propeller set for heavy circulation and quick mixing.

Tests

An interesting table showing the diffusion and horsepower is given.

Velocity readings were taken with a Price's Patent Acoustic Current Meter.

Sand and water is not a typical mixture, but for illustration it was taken as a combination far more extreme than met with in practice. Sharp sand drops out of solution instantly when it reaches a dead area or a low velocity area. In this test unit no such areas are found.

1.18 H. P. produced a flow at the top sufficient to carry sand in suspension closely approaching uniform diffusion. The test indicates that 1.54 H. P. is the logical power input for this mix.

Attention is called to the fact that 2.13 H. P. failed to produce as uniform diffusion. That is accounted for by the increased propeller pitch producing a heavier swirl, beyond the ability of the baffles to turn it into vertical circulation, apparently throwing the heavy sand centrifugally to the bottom corners.

Propeller blades were set up to several higher pitches than tabulated with a consequent higher power input, up to 10 H. P. Horizontal, or swirl velocity increased rapidly with increased power and the vertical velocity failed to increase proportionally. Terrific violence was in evidence at the bottom with but slight increase in circulation.

Tests on clay filler are of more particular interest to you. Tests were made with a small unit at Mead Pulp and Paper Co., Peerless Division at Dayton last year to determine the limiting quantity of American clay which the unit could handle.

A mixture of 3.94 pounds of clay to the gallon of water was reached before the mixture showed sluggish action or doubtful circulation. Clay was added until small coated lumps of clay appeared in the mixture. Test showed 4.43 pounds clay per gallon. Silicate of soda was added in proportion of one part to 3,000 by volume and clay was added to the point of sluggish flow. Test showed 5.16 pounds per gallon.

About 3 pounds per gallon gives a mixture which is difficult to handle in long pump lines. The agitator circulated a mixture of far heavier consistency with a heavy flow apparent at the top of the tank. Further, the unit produced thorough uniformity without lumps, instantaneously, as the dry clay was charged into the solution.

General Applications

In the paper industry there are many tubular agitators in service on clay filler in sizes from 500 gallons to 3,000 gallons, requiring from 1½ H.P. to 5 H.P.

The cement mill installations range from 100 gallons to 38,000 gallons with horsepower range from ¾ to 20.

Production foundries use them in small sizes for mixing core blacking. This process formerly required that the dry material be mixed in paste form, pounded and stirred to eliminate the lumps, and finally diluted with water to a light consistency. The Tubular unit produces the final mix instantaneously with the dry material in water.

Small units are in use in washing pulverized abrasives used in grinding wheels.

Two 18 ft. diameter machine chests are in successful use in the catalog mill of the Fraser Paper Company with a power input of about 10 H. P. each.

Two 14 ft. stock chests with ingot iron tubes are now being installed at Keyes Fibre Company plant. These will operate on about 3½ H. P. each on 1½ to 2 per cent ground wood.

Greenville Insulating Board Corporation is installing three 18 ft. chests for 3 per cent stock. These were designed to handle either short or long fiber stuff.

In the past two years the units have been built in sizes from 10 gallons to 5,000 cu. ft. In that time our experimental and development work has included a careful check of engineering design and performance of these units under actual operating conditions.

Our specifications now are based on experience in many fields and proposals carry our performance obligation.

Possibilities in the Paper Industry

If pulp and paper machinery in general had kept pace with agitator design, the improvements in modern mills would consist solely of modern drives on obsolete machines. The sole difference in agitation has been in refinement of the drives; the worm gear, herringbone, texrope, anti-friction bearings, and a few improvements for maintenance or operating convenience.

Special designs for specific applications have been made, but in the stock chests from diffuser through the mill to machine chest the choice is not in the type or purpose of the agitator, it is merely a choice of a horizontal or vertical chest for heavy or medium service.

Textbooks devote one photograph and one paragraph to agitators. To my knowledge few mill men can say whether the agitators have any effect on the condition of the stock. If it is of no importance to question the processing effect of various agitating methods the application of the propeller agitator will have to be made only on its mechanical competitive merits; price, horsepower, time, convenience, and space requirements. The paddle type is now sold almost on the basis of so much per carload.

It seems improbable that when the paper is made in the beaters and Jordans nothing can alter its condition between or afterward.

A method of agitation could be devised to partially undo the work of the refining process; to bundle and mass the fibers.

Paper is made in the beater. The fiber is segregated, cut, combed, drawn out and curled to suit the grade of paper into which it is made. No such action takes place in the beater chests, the Jordan chests or machine chests. The slow ponderous shovelling action of agitator arms can not be compared in their effect on the fiber to the action in the beater. It apparently does not injure it but surely it cannot improve or maintain the condition of the fiber.

On the other hand the propeller at high speed has a slight drawing or pulling effect and the centrifugal action tends to break up or prevent formation of fiber bundles. The tubular agitator can be likened to the beater in its frequent, continuous and complete circulation in a closed circuit.

Certainly the action on the stock is more in the nature of the treatment given in its refinement.

The extent of this conditioning effect is under investigation now in existing installations.

Whether furnishing filler, size, and alum to a chest with such agitation, ahead or behind the beater would affect the beating time is questionable, but it has been found that this type of agitation will effect thorough uniformity of these materials in the stock quickly.

The physical properties of clay filler are important. The Tubular agitator will take the full charge of dry clay at once and almost instantly produce a slip of perfect uniformity, of cream like consistency, free from lumps and without undissolved clay so that the discharge can be taken directly from the bottom in known proportion.

Much of the screenings consists of undissolved but usable clay. Thorough uniformity of the mix relieves the screen.

Three per cent stock is not the limit of the Tubular Agitator. Modifications in design effecting the propeller, the speed, the tube shape show possibilities in far heavier stuff. Only as these are worked out on a sound, practical basis will they be offered to the paper industry.

The limit we have set in stock agitation is that which can be handled with a pump. The limit is high and much experimental work must be done to approach it.

The thought which we want to emphasize most strongly is that an intelligent and persistent effort is being made to bring agitator design and effectiveness up to the standards and high efficiency of the drives which operate them, and put them on a par with present day industrial machinery.

Economics of Burning Bark and Waste Wood*

By H. A. Hatfield

The disposal of the waste wood incidental to the manufacture of pulp and paper is a matter having a dollar and cents interest to most mills. To date, the most practical method of disposal is to burn it and make steam that can be used in the manufacture of the product produced by the mill. This is particularly true of the refuse produced by drum barkers, for this sort of waste has characteristics that make it specially difficult to handle and burn. Nevertheless it is a good boiler fuel when properly prepared and fired and a remarkable return can be had on the money invested in the necessary equipment.

Some mills have chips sawdust and other wastes available besides the drum refuse. For the most part these wastes are readily prepared by drying only, and the process is the same as for bark. So, since the time allotted to this paper is short, we will only describe the equipment used and deal with the results obtained with barking drum refuse.

The difficulty, of course, is to reduce the moisture to the point where the boiler can be fired with refuse alone, at ratings comparable to coal, and do it at a price that will pay a good return on the investment. The problem is not easily solved because the weight of moisture that must be gotten rid of is much greater than the bone dry fuel in the refuse. Percentages do not give us a real idea of the work to be done and it is preferable to compare the water and dry material pound for pound. Bark removed by the so-called "dry drum" process, averages 3 lbs., water per lb., bone dry dark. Where "wet barking" is done, the refuse will probably contain 4 to 5 lbs., of water per lb., of dry material.

Let us take a case in actual practice, when the barking drum has a capacity of 15 cords per hour. The refuse removed from this quantity of wood by the wet process will weigh about 20,000 pounds, and from this we have to remove over 15,000 pounds of water before we get the bark where we want to burn it. When the wood is "dry" barked, the quantity of water to be removed is roughly 9000 pounds. These figures are given to emphasize that necessity for getting all the water possible out of the bark at each stage of the process.

Each mill has its own reasons for the barking drum method adopted and the refuse disposal plant must be designed to suit the conditions which obtain in each particular plant. In general the scraper drainer is restricted to "dry" barking plants. Rotary drainers will remove more moisture and the refuse can be flushed out from under the drum and allowed to run directly into this type of machine so they are to be preferred for wet barking plants.

The purpose of the drainer is to remove all the unabsorbed water before the refuse goes to the press and while it is not a fine piece of machinery, considerable experience is required to design a really efficient drainer of either type. The refuse leaving the drainer should average less than 70 per cent moisture, which means that this piece of equipment has to reduce the total water approximately one half.

Another reason for careful draining is very evident when we consider the bark press. All the bark presses now on the market are constant speed machines and the total area through which the water can get away from them is fixed. If the press is called upon to vent more water than it should get with the refuse, the product naturally will not be as dry as it would have been if the feeding had been done with properly drained bark.

The fact that the bark press can only exert a certain maximum pressure and it has a fixed speed and vent area, makes it necessary that it be fed evenly with the proper quantity of refuse. Even feeding is comparatively easy to accomplish with the continuous baler type of press. The bark is fed into a hopper, which is wider at the bottom than the top, so the refuse drops away from the walls instead of jamming between them. Provided it is evenly fed with the right amount of well drained refuse, a properly designed bark press will again reduce the water in the bark about one half. The pressed product should contain 40 to 45 per cent bone dry material, when the conditions are as specified. I think it is safe to say that in the majority of mills the pressed bark contains far more water than it would if careful consideration were given to draining and feeding it.

Wood refuse containing 40 to 45 per cent dry material is a useful boiler fuel, though one that has to be burned with coal or dry wood, if the boiler is to generate steam in reasonable quantities. The reason is not far to seek, for we still have upwards of 1¼ lbs., of water per lb. of dry bark. The quanitiy of refuse per cord varies according to the care taken to collect the waste. Where reasonable care is taken, both on the river and in the mill, the refuse from the 15 cords of wood we are using as an example, will weigh about 7500 pounds when pressed. In a furnace in which coal enough is fired to keep the temperature up, this quantity of refuse does the work of about 1200 pounds of coal. That is, it takes about 6¼ pounds of bark containing 45 per cent dry material to evaporate as much water as one pound coal (75 per cent eff.).

Savings

The question you will naturally ask is how well the process has paid for itself to this point, so we will not consider the economy. The barking drum in the average mill operates 150 days per year, 24 hours per day, and a reasonable price for coal is $6.00 in the bunker. Granted the drum handles 15 cords per hour, the gross yearly saving is

$$\frac{1200 \text{ lbs.} \times 24 \text{ hrs.} \times 150 \text{ days} \times \$6.00}{2000 \text{ lbs. per ton}} = \$12{,}960.00$$

The quality of coal used to maintain a high furnace temperature will depend on the method of firing. Probably 200 lbs. per hour is the greatest amount under any conditions. Using this figure the gross return from the refuse is $10,800.00 per barking season.

The process of reducing the moisture content of the refuse can be carried still further, and practically the same economic advantage gained. In this case we take advantage of the fact that we have sufficient heat available in the waste gases from the boiler under which the wood refuses are burned, to again reduce the moisture content of the refuse about one-half. When this is done the dry material exceeds the moisture in the fuel, consequently all the conditions are greatly improved. The fuel that previously was equivalent to 1200 lbs. of coal will now evaporate as much water as 1980 lbs. of coal. In addition there is a direct saving of the 200 lbs. of coal which previously had to be fired to keep the furnace temperature up. The saving is therefore 980 lbs. of coal per hour and the gross saving during the summer months due to drying the refuse is

$$\frac{980 \times 24 \text{ hrs.} \times 150 \text{ days} \times \$6.00}{200 \text{ lbs. per ton}} = \$10{,}584.00.$$

The total recovery from the complete disposal plant is

$$\$10{,}800 + \$10{,}584 = \$21{,}384.00$$

* Presented at Annual Meeting of American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 6, 1929.

The cost of the plant required will vary with the conditions in the mill. In old plants usually it is possible to re-set one of the existing boilers so it can be fired either with coal or wood. A new plant, of course, will have one or more of the boilers equipped with a combination furnace. The boiler proper will always be required for steam production, so the cost is not to be included in the charges against the wood disposal plant.

Every mill has to be considered separately for the majority have some of the necessary equipment. The worst cost will be where the drainer, bark press, conveyors, dryer, furnace brickwork and castings must all be purchased and installed. Under conditions such as those described in the first part of this paper, the above specified equipment will pay for itself in two barking seasons or 300 working days.

The motors required to operate such a plant as that described probably will not exceed 75 H. P. This figure includes 25 H. P. for the press, 5 H. P. for the drainer, 15 H. P. for the conveyors, 5 H. P. for the dryer and 25 H. P. for the draft fan. The boilers should evaporate 21,800 lbs. water per hour (from and at) which corresponds to 630 B. H. P. Even where steam is used to generate the current, the net power available will be very nearly 600 B. H. P. In figuring the cost of operation, allow time for one man during the barking season. His work will not be difficult, as the plant is practically automatic.

Flow of Materials

The bark is sluiced from under the drum and carried in a flume to a Rotary Drainer. A Flume is an inexpensive means of handling wet refuse, particularly in plants where it is necessary to move it any considerable distance. The fall required between the drum and the discharge is comparatively small. The flume shown in the cut is 770 ft. long and has a drop of 8 ft. Changes in direction can be made as often as required without the complications that would increase to expense of mechanical conveyors.

The rotary drainer serves two purposes. It removes the unabsorbed moisture and also regulates the flow of refuse to the press. A well designed rotary drainer occupies less space than a scraper drainer and takes about the same H. P. to operate. The bark is carried from the presses to the boiler house onto the conveyor which feeds the dryer. It is removed from this belt by a scraper which pushes it off sideways onto the door at the top of the feed chute. The door forms the bottom of a hopper which has only one side, consequently the quantity of bark that can be piled into it is limited. This hopper is adjusted to hold just sufficient refuse to fill one of the trays inside the dryer. By this arrangement a fixed maximum quantity of refuse is delivered into the drying chamber and since each hopper full contains practically the same quantity of dry material, the operation of the dryer can be controlled by the change of weight in the material passing through the machine.

The drying chamber is a vertical shaft, rectangular in cross section. It is built of steel plates and angles and covered with sponge felt asbestos lagged on the outside to protect it from the weather. The trays are arranged so the refuse dumped from one tray is distributed over the next below it. Each tray is supported by a heavy square shaft, which is carried in self-aligning bearings placed outside the dryer body. A lever on the end of this shaft tilts the tray to a sharp angle so a clean discharge of the refuse is effected.

The levers on one side of the dryer are moved by a suitable attachment on an endless chain. A similar chain on the other side of the machine moves all the levers on that side. The attachments are set opposite each other, and they travel up the dryer at the same speed so the trays are moved in the proper sequence. The feed and discharge doors are operated by the same chains in a similar manner. Double doors are provided at both the inlet and discharge to prevent short circuiting either the cold outside air or the gases from the furnace. Little power is required to operate the machine since only one door or tray is moved at one time.

Drum refuse has several characteristics, which have to be provided for if it is to be dried successfully. Entering the dryer it is in a compact mass and if allowed to remain so for any length of time, it will bake in a cake which is difficult to handle. On the other hand if it is moved frequently, the individual pieces will curl and twist so the whole mass is opened up and the hot gases can get through it. Small pieces of bark and the sawdust in the refuse become very light when dried, and are readily carried out of the machine if allowed to get into a strong current of gas. You will note that in the Hatfield dryer the gases pass behind the tray in the act of dumping, so there is little tendency for them to pick up small particles.

Counter Current Flow

The fuel moves against the drying agent, which is as it should be, for then the hottest gases meet the material leaving the dryer and take up moisture rapidly while in contact with it. These gases leave the dryer when in contact with the comparatively cold, wet charge, thus utilizing fully their heat and their moisture-carrying capacity. The incoming fuel first comes in contact with the gases reduced in temperature carrying a comparatively high percentage of moisture and each piece is heated to the center before high temperature gases are applied. There is no surface hardening effect, diffusion is stimulated and the water moves from the center to the surface with increasing speed as the fuel is dumped to hotter zones, and rapid even drying results.

The preferred location for a dryer is immediately over the furnace at the gas outlet end of the boiler. There are several important reasons for this. The gases go to the machine without loss of temperature and consequently the drying is done rapidly. The fuel discharged from the dryer goes directly to the furnace by gravity, so no conveyors are required. The furnace is not called upon to supply all the heat to raise the fuel to the ignition temperature, ignition is very rapid and large quantities of fuel can be burned. There is the additional advantage that the boiler can be fired with coal at the usual end. Or to state it the opposite way, coal fired boilers can be equipped to burn wood refuse without interfering with the bunkers, etc., and operated efficiently throughout the year. A furnace located at the end of the boiler shown in the cut occupies less floor space in proportion to the volume and grate area. The flame travel is longer so the gases and air are well mixed. The importance of long flame travel and large furnace volume cannot be overestimated where moist wood is the fuel used and the boiler is operated at high ratings. The moisture is rapidly turned to steam which occupies more space than a corresponding weight of gases and delays the mixing of combustible and air. When the distance between the grates and tubes is short, small particles of fuel driven off the fuel bed hit the tubes while incandescent and are extinguished with a corresponding loss of heat. In a high setting the distance is great enough to allow these particles to be consumed befort they reach the boiler surface.

In closing I would like to refer again to the economic side of the plant, still taking for our example the mill in which the barking drum handles 15 cords per hour. This means in most news mills, that 7½ cords per hour 300 days per year, will be used in making the product. Therefore the mill will produce about 120 tons every 24 hour day, or 5 tons per hour. In the average mill in summer months 10,000 pounds of water are evaporated per tons of news, so in this particular mill the steam requirement is 50,000 pounds per hour. From the drum refuse alone we are able to get 21,800 pounds per hour. The cost of steam, based on coal at $6.00 is about 30c per 1000 pounds, or $3.00 per tons. So, on a ton of news the bark disposal plant saves $1.30.

The Buffer Process*

By A. W. Wickham[1] and R. W. Shaffer[1]

In the manufacture of sized liner paper board due regard must be had for the chemical constituents of the filler plies. The Buffer Process, as the name indicates, is one wherein provision is made for preventing a desizing action of the liner by alkaline filler stock. Continuous neutralization and coagulation prevent losses and furthermore insure effective sizing.

When following this process, the liner stock is sized by rosin size and alum in the beater, in accordance with the time honored method. A size emulsifying system is not necessary. However, effective sizing is produced when using very much less of size and alum than the qauntities heretofore required to produce an adequate sizing effect in the finished board. While our process contributes toward uniform sizing at low cost, it is not to be confused with methods of sizing, i. e., size precipitation. On the other hand it is primarily a method for prevention of desizing of the liner.

The key to this process is the maintenance of slight acidity of the stock in the vat next to the liner vat. A portion of the filler stock is treated just prior to delivery to the machine. The influence of the alkaline stock comprising the other filler plies of the board is thereby prevented from desizing the liner stock during couching and pressing.

The desired result is accomplished by adding alum by means of a dry feeder to stock forming the ply next to the sized liner. The feeder may be belt driven from a near-by shaft, or driven by a ¼ H. P. electric motor. The amount of alum applied at this point (preferably at the screen) is dependent upon the alkalinity of the filler stock.

Effect of Alum

The addition of alum at this point produces the following effects:

(a) It bars the entrance to the liner of alkaline water squeezed from the filler plies at the presses, and thus prevents desizing of the liner.

(b) It produces a freeing action of the stock, thereby making it possible to dry the board more readily.

(c) The freshly precipitated floculent aluminum hydroxide formed at this advantageous point by the addition of the alum, entrains such of the size-alum precipitate as was made in the beater, but which was not firmly attached to the fibers of the liner stock. This coagulation causes the size-alum precipitate to be retained in the board and enhances the sizing efficiency.

The use of the process effects an improved formation of the sheet with increased Mullen test and better finish. In addition, the Buffer Process is of great value in the manufacture of colored liner board, since it prevents a variation in the shade, such as frequently results from the action of the filler stock upon the color of the liner.

In the production of a rosin sized liner board, which is acceptably resistant to water and possesses other characteristics requisite for such board, the acidity must be held within reasonable limits. In other words, if wide variations of acidity prevail, uniformity of sizing will not be obtained. Check tests may be easily made. These are expressed in terms of pH units.

Test on Kraft Lined Container Board

The accompanying graph pertains to the manufacture of kraft lined container board with mixed paper filler. Treated white water is utilized, fresh water makeup being used but sparingly. The curve has been drawn by plotting pH tests made to record the prevailing quality at several stages of manufacture.

1. This represents a pH of 6.5, the result of a test on water squeezed from the beater stock after the liner furnish had been beaten for half an hour.

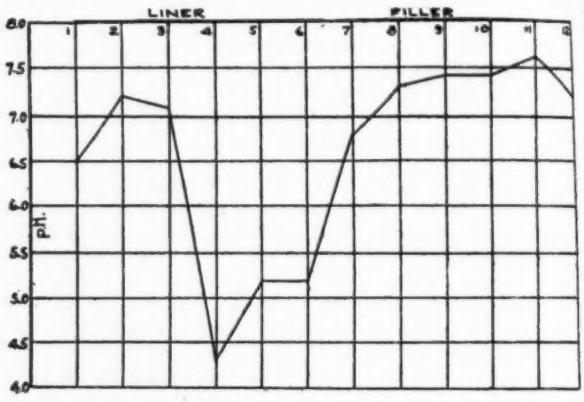
2. A pH of 7.2 was noted fifteen minutes after the addition of size.

3. This represents a pH value of 7.1, following the addition of color.

4. This represents a pH value of 4.3 following the addition of alum, but before any dilution water was added to the stock for dumping.

5. This test shows an increase of pH to 5.2 following addition of the dilution water. This test may be made from a sample taken at the Jordan head box or any convenient place ahead of the machine vats.

6. The sixth test of the series, pH 5.2 was made of vat overflow water from No. 1 liner vat (nearest the presses). When the dilution water is practically neutral this reading should be identical with the "After Dilution" reading, and if so, shows that no detrimental reactions have taken place in the chest.



7. The pH reading 6.8 shows the condition of the Buffer vat (No. 2) overflow water. In this case the filler stock as furnished to the vats Nos. 2, 3, 4, 5, and 6 was identical, except for the addition of alum at screen No. 2. The pH value of the Buffer vat overflow should never exceed 6.8, except temporarily. Values as low as 6.5 are permissible if the alkalinity of the filler vats is abnormally high. However, a lower pH value than 6.5 of the Buffer vat overflow is not advisable.

8-9-10-and-11. These pH tests 7.3, 7.3, 7.4, and 7.6 show the quality of the vat overflows from vats number 3, 4, 5, and 6.

12. The final pH check on the machine is made on water collected at the first press. This value, 7.2, is desirable when using three rubber and three felt couches on a six cylinder machine. Variations from pH 7.2 will result, depending upon the kind and quality of felts and couches used. An alkaline reading (pH greater than neutrality, 7.0) at the first press is not evidence that the entire sheet is alkaline.

Other standard pH curves have been developed for different kinds of sized liner boards.

In one mill making .016" 85 pound test waterproof container board, the liner stock is sized with 16.5 lbs. of 60% wood rosin size and 22 lbs. of alum per ton of liner stock. These sizing chemicals are furnished in the beater. No alum or size is applied to any of the filler stock in the beaters, reliance being placed on the addition of the dry pulverized alum at rotary screen No. 2, in order to insure effective sizing. The amount of buffer alum required is approximately four pounds per ton of board produced.

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 6, 1929.

[1] MacAndrews & Forbes Co., Camden, N. J.

made, all showing a different result, and it appears impossible to establish a standard for melting point of rosin size.

Hydrogen-ion Control

There is no question but in many cases in the manufacture of paper and board of various grades that an excess of both size and alum are used, very much more than is required for efficient results. A proper proportion of each is also very important.

Today a positive method has been invented and perfected, that can be used to check up at certain vital places, all the various elements and conditions that effect sizing, by the application of the hydrogen-ion comparator, and by its intelligent use the pH values can be adjusted in the various points of the process to a close conformation to the perfect curve. By this means any degree of sizing for water-proofing and water resistance of paper, can be secured and maintained.

With the use of this control system there is a certain amount of coagulation taking place, and the sizing effect cannot escape on the machine due to this coagulating and neutralization process continually talking place. Due to the fact that size and alum is reduced to a minimum, foam is also reduced, and can be controlled by proper pH values.

In making colored lined boards this control system has been found particularly valuable, in enabling uniformity of shade to be maintained throughout an order.

When using a closed, or a partially closed white water system on the machine, either with or without a chlorinating system pH values can be adjusted to take into account any variables that may occur and proper adjustment secured by use of the control system.

With the system properly controlled, it was found that a better formed sheet and increased production would be obtained.

Owing to the simplicity of the control process, any intelligent workman can easily and quickly learn the method of application, and keep an absolute check on operation. A standard graph or curve can be worked out and used to check up the operations at certain stated times, and will show where corrections are needed to keep results uniform.

Practicability Demonstrated

Fifteen months of continuous operation in a plant making one hundred sixty-five, (165), tons per day of finished board, of various kinds, grades, qualities, and colors, has demonstrated practically and thoroughly, the improved product, and money saved on size and alum, secured by its use.

The Shive Count as a Factor in Mill Control *

By A. B. Larcher[1]

Some of the causes underlying the varying of the quality of the product of soda pulp digesters are:

1. Variable length of the chips charged.
2. Variations in the moisture content of the chips.
3. Varying weight of dry chip per charge per digester.
4. Irregularities of steam pressure.
5. Imperfect circulation of caustic liquor through the charge.

These causes result in a variation of the proportion of imperfectly cooked material delivered to the washing equipment.

Some additional causes of variation in the quality of the unbleached pulp delivered to the bleaching department are:

6. Imperfect separation of the liquor from the pulp in the washpans or on the vacuum filters.
7. Varying efficiency of the unbleached pulp screens.
8. Variations in the ratio of bleaching agent to pulp due to uncertainty as to the weight of dry material being furnished to bleaching apparatus contribute another cause of irregularity in the quality of the bleached pulp as also do variations in bleaching temperatures and time of bleaching and imperfect separation of the pulp from the products of the bleaching operation.

The quality of the finished fiber is further affected by irregula performance of white stock screens, varying density of pulp in the stuff chest and varying pressure of steam in the machine dryers.

Shive Count

The lack of uniformity due to those causes may exhibit itself in the color, clean lines, freeness and moisture content of the pulp upon which the paper mill depends for a vital component of its sheet. In many cases irregular quality due to these causes can be avoided by careful operation, but failures are sometimes highly probable due to unforeseen changes in conditions, in adequate equipment or hidden defects therein. A test procedure which will make evident the degree of perfection with which the different steps in the process are carried out may be a very useful aid in the control of manufacturing. Such a procedure is found in the "shive count." By its use the number of visible particles om imperfectly cooked material or "shives" in a known dry weight of pulp is determined in the material leaving a step in the process.

The number of shives may be assumed to be in inverse ratio to the perfection of the reduction of wood to pulp. When determined in pulp discharged from the digesters it indicates how completely the cooking has been done. If the determination is made after the pulp leaves the brown stock screens knowledge is gained of the efficiency of the screening operation, and when made in the pulp after bleaching, information as to the effectiveness of the bleaching process is derived. As a final check a shive count on the finished pulp serves to grade the product so far as shives are concerned. By applying the test early in the process, errors or defects in the wood preparing or digesting procedure can be detected and changed before the material in the later steps is contaminated. An occasional batch of under par material can be detected and steps taken to correct the quality, before it is too late. The procedure of shive counting is simple and easily carried out. When done on pulp just blown from digesters a sample is taken from the wash pan with a long handled sampling dipper having a perforated bottom.

It is not difficult to obtain a representative sample if care is taken to avoid the first material discharged from the digester.

The black liquor is washed from the sample and a quantity of the material equal to the desired weight of brown pulp is taken for the test.

The sample is given a quick treatment with an excess of bleach. This makes the shives visible without destroying them.

Antichlor is added to arrest the action of the bleach before the shives are attacked. The sample is then made into a circular disc by throwing onto a fine wire screen in a Buchner funnel. This disc is pressed and examined wet by looking through it at an electric lamp.

The procedure for brown screened pulp is identical except that no washing is required while in case of bleached pulp the treatment with bleach and antichlor is omitted.

Application of the Test

By the application of this test to pulp from digesters, cooking schedules and times may be adjusted from the results of the observation of a few cooks. Bleach requirements can be predicted in advance and the uncertainty as to quality so far as organic impurities are concerned largely eliminated.

* Presented at Annual Meeting of American Pulp and Paper Mill Superintendents Association, Wausau, Wis., June 7, 1929.

[1] Supt. Penobscot Chemical Fibre Co., Great Works, Maine.

No difficulty arises due to slow solubility of the alum which is added as a buffer. The dissolved alum reacts promptly with the alkaline filler stock.

The Penescope is used to test for waterproofing. These determinations, whose results are definite numerical values and which may therefore be recorded, furnish conclusive evidence of the extent of sizing obtained.

Definite and accurate control which is readily maintained insures better formation and increased average strength of the board, since disturbing influences of varying filler stock are nullified.

The outstanding advantages resulting from the use of the Buffer Process are:

1. More uniform sizing.
2. Decreased cost of sizing.
3. Better formation.
4. Increased strength.
5. More uniform color.
6. Increased production.

Rosin Sizing*

By Almeron W. Wickham[1]

The following article regarding the use of rosin size is compiled from the observation and practical experience of a paper-maker. The opinions expressed are to be taken as the belief of one man, except in statements where credit is given for quotations. The final results of more than fifteen months' operation with a control system are positive and beyond dispute.

Formerly Made by Superintendent

It is a matter of history, although within the memory of many mill superintendents of today, that rosin size was formerly made at the mill, by or under the supervision of the superintendent. A stated weight of pounded rosin was cooked or boiled with a stated weight of soda ash, and measured quantity of water, until the wax was formed.

This method was superseded by the steam jacketed kettle, instead of the direct application of steam to the mixture. This method overcame the undesirable, and variable factor of condensation by direct application of steam. Then came the manufacture of size from the gum rosin, by companies in a commercial way, and the marketing to the mills of the wax size. Later, and comparatively recently, wood rosin size was distilled from the pine wood and stumps. These processes resulted in a more uniform product for the use of the paper-maker, and simplified its use by them.

Various emulsifying systems have also been invented, with the idea of obtaining greater efficiency. One authority states "that rosin size does not form a film, and does not close up the inter fibre spaces, unless used in excessive quantities, which causes foaming, brittleness, and a deterioration of sheet due to excessive acidity on account of excess of alum necessary to precipitate the size. Rosin size does, however, fill up the pores of the fibres themselves, with a rosin size aluminum precipitate, which renders the inter fibre spaces more water resisting, through a surface size diffusion effect." "Good rosin-sizing can be more efficiently done with the minimum amount of size when the degree of beating is sufficient to give a maximum of inter fibre space by having a high degree of hydration":—That is, the beating and hydration must be consistant with the character of the paper being made, and the formation desired.

It is generally conceded that the strongest papers are unsized, and will maintain their strength provided the hydrogenion content is near the neutral point. Paper with too high acidity will deteriorate and lose its strength by oxidization, and high alkalinity will soften paper by its taking up more moisture than it should.

Degree of Sizing

The degree of sizing, or resistance to water absorption, must be graded in accordance with the uses to which the paper is to be put, and the paper manufacturers should be made acquainted with the requirements that they may more intelligently do their best to conform to them.

In certain types of board, such as test liner or container board, it is of great importance to make perfect adhesions between surfaces of paper, and hard size papers resist penetration of the colloidal adhesive, and a moderate degree of penetration into the inter-fibre spaces is necessary to make a proper bond. Hard sized papers require special adhesives.

Temperature of stock during beating has an important bearing on sizing. Mr. James Strachan in his exhaustive article on hydration or inhibition as he terms it, gives the following results from an experiment carried on with cellulose:

Temperature of water	Per cent of hydration	Per cent of dehydration
51.2 deg. F.	69.72	...
107.6 deg. F.	66.80	4.2
140.0 deg. F.	63.98	8.2
212.0 deg. F.	56.51	18.9

Dehydration produces porocity and air spaces in the stock, and with use of high temperatures dehydration is continuously progressive. The experience of the practical paper-maker, bears out the truth of this statement, and he finds that when his stock is too hot, good sizing cannot be secured. It has been demonstrated that good practical results can be obtained with a temperature of 105 deg. to 110 deg. F. and that good hydration can be secured at this temperature. Experience has demonstrated that the size or emulsion of same should be added to the beater as soon as possible after it has been completely furnished. Undoubtedly finely divided rosin as furnished to the beater of stock, sticks on the fibres and fills the pores and inter-fibre spaces, so that when the sulphate of alumina is added just before dumping, a rosin aluminum precipitate is formed on the fibres.

Difference in Melting Points

A considerable difference in the amounts of various commercial sizes in the degree of sizing effect has been found, which is probably due to a marked difference in the melting point of various rosins, and the size manufacturers in order to get best possible uniformity in manufacture, blend the various grades. But in spite of this there is a great difference in melting points of the rosin in the size as furnished to the paper mill. There is possibly a difference in this respect also caused by the methods of the various manufacturers.

Many tests have been made by the paper-maker to ascertain the melting point of rosins as they come to him. There are various methods of doing this and in one particular test on size from three different manufacturers the following results were obtained:

No. 1 Melting point starts at 178 deg. F. completed at 210 deg. F.
No. 2 Melting point starts at 160 deg. F. completed at 174 deg. F.
No. 3 Melting point starts at 150 deg. F. completed at 165 deg F.

This difference indicates that size with lowest melting point, would be more rapidly fluxed on the dryers of the machine, than the others. It was found also that the size of lowest melting point, gave the finest rosin aluminate precipitation, and less size could be used. As a matter of fact in repeated tests, it was found that 25 per cent less could be used of No. 3 than of No. 2 and 40 per cent less of No. 3 than of No. 1 and 20 per cent less of No. 2 than of No. 1. These tests were made on sizing the liner of test liners. While the tests regarding melting point of rosin size just mentioned, must not be considered as absolutely accurate, they do show that some degree of variation in melting point of various rosin are to be expected. Innumerable tests might be

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 7, 1929.
[1] Supt., MacAndrews & Forbes Co.

The Printer's Paper Problems*

By Ronald I. Drake[1]

It is rather unseeming in one whose connection with the printing industry covers the brief span of six years, to attempt to present to you mature paper-makers, a paper of this nature. I note that the subject on which I have been requested to speak today is not a new one but that it has been presented before this body many times. The earliest reference that I find is a paper by Mr. P. J. Massy, through whose courtesy I am here today, which was presented in 1920. It is interesting to note that the subjects which he discussed at that time are still the subjects to be discussed at this time. And the question naturally comes to mind as to why, after all these years, the printer should still have the same complaints to make.

I am not here to tell you how to correct these troubles, but rather to present in the best manner possible, the problems which the printers of today still have to face in producing for their customers—on your paper—a product which will be satisfactory from the standpoint of quality for the customer, production for the printer and absence of complaint for the paper-maker.

Those of you who have heard papers by previous printers will recall that they stressed most strongly certain mechanical defects of the paper. It is, therefore, only natural that I should first present these same existing defects as I have met them in my daily contacts in the printing plant.

The first of the so-called mechanical defects is splices. It does not seem possible to convey to the paper-maker the importance to the printer of a well-made splice. If it were possible for you to see the lost production, the high waste, the battered plates and the broken down makeready which are caused by poor splices, I am sure you would appreciate that no amount of time and care in making them should be spared. Others have told you of the rapid progress being made by the manufacturers of presses in developing high speed web presses. You can appreciate, therefore, that if a poorly made splice is allowed to run through a press traveling at a speed of 900 to 1000 feet per minute and this splice fails, the end of the sheet is going to be caught by the revolving cylinders and wrapped many times about them before the pressman can stop his press. When you realize that the distance between the impression cylinder and the plate cylinder is a very definite figure which cannot be exceeded without more or less serious damage to the plates and to the makeready, you will appreciate that the added thickness caused by the wrapping of this loose end about these cylinders can easily destroy the plates on the press, and sometimes the press. Such destruction represents the actual value of the plates and the labor cost which consists of the work of several men for anywhere from 16 to 48 hours, and amounts to several hundreds of dollars. Isn't this too great price to pay for a poor splice which could have been made a good splice by one or two men working carefully for about three minutes?

In addition, there is a loss of several pounds of paper which, when the occurrence of poor splices is frequent, very soon represents a 1500 pound roll of paper. And we still haven't considered the amount of money which the printer loses in production and time necessary to repair the damage.

Soft Rolls

Another defect which we are finding in increasing quantity is soft end rolls; and not only soft ends but we are finding soft spots and streaks which run entirely around a roll, varying from the ends to the middle. The buyer of printing today is turning more and more to the use of color and when a printer is forced to run a roll with soft spots, whether they be at the end or in the center of the roll, he finds it impossible to maintain his color plates in register. Also these soft spots under the tension of his press, cause the paper to form wrinkles and these wrinkles, representing a definite increase in the thickness of the paper, cause battered plates and broken down makeready. I cannot at this time emphasize too strongly the need for extreme care in shipping to the printers you may supply, only those rolls which are firm and hard from end to end.

Hair Cuts

The third defect which we still find is numerous hair cuts which cause the web to break, and frequent slime spots with their attendant lowering of the printing quality; not excluding the fact that, if they occur near enough to the edge of the sheet, they, too, cause the web to break. And a broken web on the modern high speed rotary press means several minutes of lost productive time which, to use an old and trite saying, means money.

Turning now to the problems associated with what I class as the physical characteristics of paper. I find that there are four definite characteristics by which a paper may be judged for its good or bad printing quality. Before considering these four characteristics, I believe it best to digress here for the benefit of those who are not familiar with the printing process.

In the process of printing, the printer assumes first that the sheet of paper on which he is to reproduce the thoughts and ideas of his customer is a plane, level surface, uniform in thickness from edge to edge of the sheet and from end to end of the roll. Needless to say, should any paper-maker ever present a printer with such a sheet, he would think the millennium had come.

There are on the press, two cylinders which are spaced about one-quarter of an inch apart. On one of these cylinders, the plates are locked; on the other, is built up with various thicknesses of paper, a packing, called the makeready which is intended to compensate for any variation in the subject matter, and in the thickness of the plates and of the paper.

Paper is not a finished material and in order to produce a readable, commercial product, makeready is necessary. Even enamel stock, which is considered to be as near a smooth, plane surface as can be made, requires makeready to adjust for its variations. And a satisfactory makeready is arrived at only at the expense of much labor and money.

When the makeready has been completed, the distance between the face of the plate and the surface of the makeready is that represented by the thickness of the paper to be run. The amount of pressure upon the surface of the sheet should be only sufficient to cause what the printer calls a "kiss" impression—and a gentle one at that.

Formation

Returning now to consideration of the four determining characteristics, the first of these is formation. No explanation of the variation in the thickness of the paper, due to variation in the formation of the sheet, is necessary. You can appreciate that a wild formation will result in a spotted variation in thickness and, as a consequence, will vary the amount of pressure between the plate cylinder and the makeready cylinder, and when such wildness is excessive, this variation may be sufficient to crush the plate. Even should the plate not be crushed, the quality of the printing will suffer. With a streaked formation, the same conditions hold and we find both of these especially marked in the light weight catalog print papers.

Poor formation also causes serious loss of opacity and loss of resistance to the penetration of the printing ink. Another defect which I find in the light weight catalog print papers, especially in the 19, 21 and 22½ pound weights, is the presence of innumer-

TAPPI Section, Page 212

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 7, 1929.

[1] William F. Hall Printing Co.

able pin holes. These may be due to poor formation, though I have found them in sheets which I have considered a good formation. You can readily see that these pin holes allow the printing ink to pass directly through the sheet and cause that bugbear of the printer "show through."

Finish

The second determining characteristic is finish. And the most important factor about finish is that it must be as near uniform from side to side, front to back, end to end and edge to edge as human endeavor and mechanical perfection can make it. It need not be high or low or medium finish, but it must be uniform finish. I cannot stress that point too strongly—for if the finish is uniform throughout a shipment of stock, the printer can adjust his press conditions and ink qualities to fit that stock and then be happy in in the steady production of high quality work.

Regarding the relative value of a high finish or a low finish, I have only this to say—and it applies in all things—avoid extremes. The printer wants as smooth a printing surface as the paper-maker can produce for him but he does not want a hard, glossy surface one that is calender blackened, crushed and hydrated until no ink will "take" to the sheet. Nor does he want a sheet which is so low in finish that it may best be likened to the old-time corduroy roads for smoothness.

When the finish of a sheet is such that it may be likened to the above mentioned roads, it is necessary to increase the packing on the makeready cylinder. This increases the pressure on the plates, and will very quickly wear off the surface of the plates, causing loss in sharpness of detail and in printing quality.

From the number of tests which have been made in the laboratory, I find fairly definite evidence that in the book papers especially, the qaulity of the printing surface is intimately connected with the ash content and with the sizing value. This, of course, is not anything new—paper-makers have always known that a well-filled sheet makes a good printing sheet. But we are going further than that. We are establishing standards of printing quality, and, we will use the filler content together with the glarimeter reading and the size test as a measure of that printing quality.

Therefore, for the paper-maker to have a satisfied printer customer, let him make a uniform finished sheet of whatever finish his order may call for, avoiding the high gloss and polish of a crushed sheet and the low, rough and ragged surface of no finish at all.

Opacity

The third characteristic is opacity. As paper-makers you are perhaps aware that the trend of the mail order houses is toward lighter weights in their catalog papers. And when there is considerable show through and strike through of the printing ink, the printer gets all the blame. There is a limit to what the printer can do with his ink to prevent "show through" or "shadow through". Therefore, he turns to the paper-maker and passes on to him all the complaints of the customer.

Much of this might be avoided by the paper-maker closing up his sheet as was mentioned under formation. Then, secure the desired finish without crushing, which, as you all know, causes a transparent sheet. And, finally, fill it up with clay if a book stock, with a fine, soft, smooth ground wood, free from slivers and shiners, if it is a print sheet. But again, close up the formation and a marked increase in opacity will result.

Sizing Value

The fourth and final determining characteristic of printing quality is the sizing value of the sheet. I am going to make a statement here which is contrary to the generally accepted opinion of printers and paper-makers and is one which you will have to take as a personal opinion because the amount of work which has been done in the laboratory regarding it, is not yet thorough nor complete enough from which to make a positive statement. This opinion is that the sizing value of a sheet of paper does not determine its resistance to the penetration of the printing ink. By this I mean that the harder sized a paper may be does not necessarily mean that that sheet of paper will be more resistant to the penetration of printer's ink. Most of you are familiar with the method used in determining the sizing value of a sheet of paper; namely, to float a small piece of the sheet under consideration on the surface of a standard ink solution. This solution is principally water with coloring matter. Printer's ink, as you all know, is basically oil with coloring materials. Therefore, it is not unreasonable to conclude that the relationship between these two is not similar, nor even proportional, in their penetrating effect on a sheet of paper.

This naturally leads to the question—what is the importance of sizing? The little work which has been done in the laboratory indicates that the importance of sizing lies entirely in its effect upon the three previously mentioned characteristics, especially upon the finish and the opacity of the sheet. You know that one of the purposes of sizing is to bind together the fibers which form the sheet and whatever filler material may be added,—especially clay. Therefore, if you deliver to the printer a sheet containing a high percentage of clay you must also have a high size value on that sheet in order to firmly bind the fibers and the clay into a compact mass. If you have a high filler content and a low size value, the printer, in endeavoring to print this sheet, finds that his ink picks the clay and the fiber from the surface of the sheet. This causes his inks to run dirty and his halftone cuts to fill up. Naturally, this represents lost production, since, in order to maintain the quality of work which his customer demands, it is necessary for the pressman to stop at frequent intervals and scrub out his plates. It also causes a high waste of ink, since this clay and fiber which is picked up, due to the nature of the press rollers and of the ink, works back to the ink fountain and dirties all the ink in the fountain. Such ink must then be taken out of the fountains and discarded entirely, unless the printer is equipped with the necessary ink mills to regrind this dirty ink and salvage a part of it. Even with regrinding, the loss of ink so dirtied runs very close to 20 per cent.

These, then, are the four characteristics which I consider to be the determining factors of the printing quality of a paper. Since they are all easily determined by the properly equipped laboratory, it is not difficult to establish definite standards for these factors and I believe that I can prophesy at this time that you will find the larger printers of today establishing plant laboratories in which they will determine the printing qualities of all papers submitted to them and will accept or reject your papers on the basis of the four characteristics I have mentioned.

Shipping Paper

There is another factor which has always been one of considerable contention between the paper-maker and the printer, and about which there are as many opinions as there are printers and paper-makers. I am referring specifically to the questions which arise in the loading and shipping of paper, whether that loading be in the form of rolls, skids or bundles. Considering the shipping of rolls, the first point I shall make is that much complaint regarding paper damage in transit could be eliminated by a careful inspection of the car in which it is to be shipped before loading the paper therein. I still find, after all the discussion there has been on this point, that rolls are loaded into cars in which there are bolts and nails protruding from the walls and the floor of the car, in which there is bad flooring or side walls and in which tar and oil has been spilled and allowed to remain to soak into the paper.

Uniform Diameter Rolls

Next in importance to proper inspection of the car before loading—is that of having all the rolls of as near uniform diameter as possible. It has been found that in cars so loaded,

the paper rides better and there is considerably less shifting of the load. This applies whether the rolls are loaded, standing on end or lying on the side. Further help to prevent damage may be secured through the use of bands. The best practice seems to be to use a band not less than two inches in width and to band the rolls together in units.

On one account on which damaged paper was running from two to two and one-half per cent per month—the use of such bands has reduced the loss to two-tenths of one per cent.

Proper Wrapping of the Roll

Another factor which must not be overlooked is proper wrapping of the roll, especially the ends. I recall that a mill once sent in a shipment of paper which they had banded at each end of the roll, directly next to the white roll, with a three-fourths inch steel band. When this paper reached the plant, these bands had cut into the rolls so far that it was necessary to strip from twenty-five to thirty pounds of white waste off of each roll, before they could be run. This mill unquestionably meant well—but it hardly seems possible that much thought was given to the problem—otherwise these bands certainly would not have been applied as they were. These bands would probably have been of some value in protecting the roll had they been applied on the outside of the wrapping.

Nearly all of the flat stock, which we receive, is shipped to us on non-returnable skids as we are well equipped to handle them. Such mode of delivery speeds up our production and reduces our storage space requirements materially. We, therefore, suggest to the mills shipping stock in this manner, that they band or wire these skids together in units of three (on a 12 skid per car basis) and eliminate all blocking. Such method of loading cars, we find allows the skids to slide on its runners. when the car is jerked and banged about, instead of, as with a blocked car, having the paper slide off the skid. If the skids have worked up in front of the car door, we simply insert a heavy jack and jack back the entire end of the load until we get enough room to use our lift trucks.

Result of Observations

In closing, I wish again to stress that whatever information I may have presented, is the result of the experiences and observations of our printing plant. I know that many others may perhaps hold directly opposite views. Therefore, what has been said here is not the last word nor the final voice of authority—but if it has been of interest, if it has been of some value, I shall be happy in the knowledge that I have not entirely wasted your time and your courteous consideration.

The Toledo Continuous Weighing Scale*

By E. G. Thomas

IN every commercial process producing a continuous strip or sheet it has always been a problem to determine the weight being produced with sufficient frequency and accuracy to keep at a minimum the making of off-weight goods even though a generous tolerance is allowed.

Micrometer gauging of a given sheet is possible only at a comparatively low speed of production, is intermittent at best, is possible only at the edges of the sheet and gives no information about its center, while different results are often obtained by different observers from the same material. Sampling at the end of a roll is intermittent in the extreme and offers no guarantee that all possible weight variations may not have occurred between sampling. It offers no cure for the faults of a roll which has been made nor for those of the greater part of the succeeding roll, and it spoils a certain amount of material.

As a solution to this important problem of weight control in the paper industry of a sheet of material, the Toledo Scale Company has put upon the market the Toledo Continuous Weighing Scale which places before the machine tender a continuous indication of sheet weight. The determination of weight is obtained so close to the point of production that the effect of every adjustment of the producing machine is immediately observed and adjustments may therefore be conveniently made so often as to very greatly diminish the variations in weight and permit a reduction in tolerance allowed.

A continuous weighing scale installation is made by supporting on a movable roller, which is hung from scale mechanism, the center of a substantially horizontal sheet of the material to be measured. The weight of the sheet is offset by an appropriate poise and a Toledo pendulum equipped with a pointer traveling over a chart. The scale is set for any desired weight per running unit of length by appropriately locating the poise on a graduated beam, while the movements of the scale indicator show the departure of the sheet weight from the normal.

The arrangement may be likened to three piers of a suspension bridge. If a chain is stretched across the piers, the middle pier will obviously support one-half the weight of each of the two spans, assuming the tops of the piers to be in a straight line. If a heavier chain is attached to the first and pulled over the piers, the load on the central pier will be correspondingly increased. In a similar way the load on our weighing roller varies with every change in the unit weight of the traveling sheet of material and the change in weight is indicated by the movement of our pointer over the dial, so that we present a continual guide to the workman as to that change in the setting of his machine which will again bring the sheet to its normal weight.

Substantial Entrance in Paper Field

While the distribution of the continuous weighing scale has been greatest among the manufacturers of roofing and rubber materials, a substantial entrance has been effected into the field of pulp and paper-making since these scales are now weighing, in various mills, pulp, roofing paper, boxboard and bond paper. However, I wish to state the results obtained in these other fields and describe the method of applying the scale in other industries, for the scale is entirely impartial in reference to the material passing over it, making the same report for equal variations in asphalt roofing, auto top, paper, tire fabric, sandpaper, belting, so that the favorable results obtained in one industry may be expected in another under proper conditions. Therefore, installations in any industry will illustrate its value.

Asphalt roofing after being made must cool down before it can be rolled or cut into shingles, and a strip 400 to 500 feet long ordinarily hangs in festoons between the coating machine and the cutter so that its heat may be dissipated. In consequence, the weight of the sheet cannot be noted until 500 feet has been made, and if wrong, the effect of an adjustment can not be noted until another 500 feet has been made, so that in the past the weights have been very irregular and the manufacturers have had to settle complaints because of both light and heavy rolls or bundles, the former because the roofing was not up to standard and the latter because of the addition to the freight charge. The installation of the continuous weighing scale close to the coating rolls has reduced the variation to a negligible amount and produced savings equal to several times its cost in a year. A very large percent of the roofing industry has been equipped with this apparatus.

* Presented at Annual Meeting of the American Pulp and Paper Mill Superintendents' Association, Wausau, Wis., June 7, 1929.

Paper Machine Control

The adjustment of the paper machine, however, still is so largely guided by human judgment that an improvement in the uniformity of the finished product is possible and desirable, while a greater production and lower costs can be had if breaks in the sheet can be reduced in number.

While at first it may seem that the continuous weighing machine should be installed at the dry end of the paper mill so as to indicate the weight of the finished product, there are a variety of reasons why the most successful and most useful installation can be made at the wet end of the mill.

There are three factors which determine the practicability of a given installation of this type of machinery; first, the tension in the sheet, and second and third, the length of the possible weighing span and the weight per running foot of the material to be handled. These latter factors are more or less interrelated so that an advantageous weighing span may permit the handling of a lighter weight paper than will work well otherwise.

The conditions under which satisfactory operation can be assured are seldom found at the dry end. In the mills of the Housatonic Valley, making high grade rag papers on slow moving machines, such as the Byron Weston Company and Crane Mills, several scales have been successfully installed, but in general, the high tension in the sheet at the dry end prevents a satisfactory installation. In addition to the support afforded the sheet by its high tension, the rapidly moving paper draws enough air along with to more or less float thereon, while the effect of the rising currents of air coming from the many heated rolls and acting on the large surface comprised in the weigh span may at times completely obscure the effect of the small force we endeavor to detect.

Most Favorable Conditions at Wet End

At the wet end conditions are most favorable from the point of view of the scale manufacturer, and we believe the machine is most useful here to the paper-maker. The indication is given close to the paper machine and at the point where it is most necessary to note changing conditions if the product is to run evenly. Variations in weight resulting from happenings in the screens of the paper machine, which, if not corrected, will result in a broken sheet, are reported by the scale so promptly as to permit a remedy to be applied before the break occurs, and a reduction in breaks means an increase in production with consequent decrease in costs. Users have reported a marked decrease in wet end breaks and it is stated that a mill in New Hampshire making pulp for the rayon industry has been able to get 165 tons from a machine which previous to the installation had never produced over 125 tons. This may be an extreme case, but the possibility of gain in production through a reduction in the time lost through breakage is of utmost importance to every mill.

The continuous weighing scale, therefore, furnishes a plain warning of abnormal conditions so that breaks in the sheet may be reduced in number and a greater production assured, besides a constant indication of weight to guide the machine tender in making a more uniform product.

It is built in two types. One is adapted for materials which do not exceed 24" in width and in which the weighing roller is suspended from a scale lever enclosed in a cabinet directly over the moving strip of material. The second type is applied to material of practically any width. The scale lever which carries the weighing roller is supported in separate cabinets which are located beyond the edges of the sheet so that the housing in which the indicator and its chart are located is to one side of the producing machine. It can readily be read from a distance of 20 or 30 feet in either direction and therefore does not require the machine operator to go to the scale to note its indication. The chart housing can be made to face in any direction. Various modifications in type can be made, and several scales have been built which not only show variations in total weight of the sheet but also indicate the relative weight of the two sides of the sheet so as to detect a tapered sheet. A strip chart recording device may be attached so as to make a permanent record of the daily work, and, in general, this machinery is adapted in every case to the particular work it will have to do.

In use on paper machinery, the continuous weighing scale will show a variation of 1 lb. per ream of 24 x 36" size in an installation at the wet end, where we may have a weight span of 10 ft. and a sheet 5 ft. wide, by a motion of the indicator of the scale of an amount readily seen from a distance of 20 or 30 feet. The variations shown will be correspondingly smaller if the weight span is longer, if the sheet is of greater width, or if the ream size is smaller in area. This is not the limit of sensitiveness where conditions are most favorable, but represent an indication which seems to be suited for the average mill.

New Paper Mill for Port Angeles

A new paper mill for Port Angeles that would eclipse in size and cost anything of its type in the state was reported today to be projected by the Zellerbach interests allied with various lumber and logging concerns which have holdings on the North Olmypic Peninsula, according to the Seattle Times.

While details of the proposed plant were lacking, it was reported in circles believed to be reliable that the new mill would cost between $7,000,000 and $10,000,000.

A group of Seattle and Everett logging companies whose holdings are along the right of way of the Port Angeles & Western Railway, headed by Joe Irving of Everett, as well as the Bloedel-Donovan Lumber Company of Seattle, were mentioned with the Zellerbachs as sponsors of the projected mill.

Such a paper mill, it was pointed out, in addition to the present Zellerbach mill at Port Angeles, would offer a direct outlet for the timber of the interested logging concens, most of which is adapted to paper manufacture more than for other purpose.

The present paper mill at Port Angeles was built by the Zellerbachs six years ago and is rated as a $4,000,000 plant. An extra unit was added to it two years ago. Its capacity is 200 tons of newsprint and heavier grades of paper aday.

E. M. Mills, vice-president of the Crown Zellerbach Company of San Francisco, has been in Seattle recently and was believed to be laying plans for the proposed plant.

The paper mill contemplated comes as a development in the spirited activity on the peninsula in connection with the recent acquisition of the long-dormant Port Angeles & Western Railway by the Irving interests, and the Northern Pacific-Union Pacific alliance to top the peninsula timber from the Grays Harbor side.

Roots Co. Issues Blowers Bulletin

The P. H. & F. M. Roots Company, of Connersville, Ind., has just issued a new 16-page bulletin, Number 22-B-1 on Low Pressure Type Rotary Positive Blowers. The bulletin covers the new Roots modernized Blowers equipped with Timken, SKF and Hyatt Bearings. A dimension print, table of sizes giving speeds, capacities and horsepowers at various pressures and a brief review of various types of pumping units are included in this new bulletin. Bulletin 22-B-1 replaces the former bulletin 1011 issued by this company, and is so constructed to make it a valuable addition to the large Roots catalog covering pumps, meters and blowers.

Sen. Deneen To Have Charge of Paper Schedule

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 12, 1929.—Senator Deneen of Illinois has been made chairman of the subcommittee of the Finance Committee having charge of the paper schedule of the tariff in the Upper House of Congress. Other members of this subcommittee include: Senators Keyes of New Hampshire, Couzens of Michigan; Thomas of Oklahoma and Wash of Massachusetts.

The committee has announced that hearings will begin on the paper schedule on June 13.

Recent Installation in Pacific Coast Mill

International Grinders

Curtis Patent.

Three Pocket for Four Foot Wood. Built in two stone sizes, 60" x 54" and 54" x 54". Normal capacity 15 to 18 tons.

Full particulars on request.

Montague Machine Co.

Turners Falls, Mass.

FOR EVERY GRADE OF PAPER

WE HAVE A

STRENGTH and STRETCH TESTER

which will insure your arriving instantly at the point of knowing just the character of paper you are producing.

They eliminate all guess work and are a guarantee that your product is just what you desire.

Model 201 B
Schopper Strength and Stretch Tester

MADE IN DIFFERENT SIZES AND STYLES FOR HAND, GRAVITY, BELT, ELECTRIC OR HYDRAULIC DRIVES.

WRITE FOR BOOKLET DESCRIBING DIFFERENT TESTING INSTRUMENTS

FOREIGN PAPER MILLS Inc.

72 Duane St.—New York

Imports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JUNE 8, 1929

SUMMARY

Cigarette paper .....574 cs.
Wall paper .....12 bls., 21 cs.
Paper hangings .....25 bls., 17 cs.
News print .....8,938 rolls
Printing paper .....44 rolls, 193 cs.
Decalcomania paper .....71 cs.
Surface coated paper .....60 cs.
Baryta coated paper .....60 cs.
Metal paper .....48 cs.
Fancy paper .....2 cs.
Painted paper .....4 cs.
Packing paper .....12 cs.
Photo paper .....5 cs.
Writing paper .....72 cs.
Filter paper .....41 bls., 27 cs.
Drawing paper .....50 cs.
Tissue paper .....61 cs.
Colored paper .....92 cs.
Basic paper .....25 cs.
Silk paper .....2 cs.
Carbon paper .....2 cs.
Stencil paper and ink .....50 cs.
Mould paper .....1 cs.
Vellum paper .....5 cs.
Miscellaneous paper..1,828 rolls, 358 bls., 357 cs.

CIGARETTE PAPER

Standard Products Corp., La Bourdonnais, Havre, 225 cs.
American Tobacco Co., La Bourdonnais, Bordeaux, 200 cs.
Standard Products Corp., De Grasse, Havre, 23 cs.
Standard Products Corp., Paris, Havre, 26 cs.
British American Tobacco Co., Olympic, Southampton, 50 cs.
British American Tobacco Co., Mauretania, Southampton, 50 cs.

WALL PAPER

F. J. Emmerich, Hamburg, Hamburg, 6 bls.
Wedeman, Godknecht & Lally, Hamburg, Hamburg, 1 ble.
Guaranty Trust Co., Hamburg, Hamburg, 8 cs.
A. C. Dodman, Jr., Inc., American Banker, London, 8 cs.
F. A. Binder, Muenchen, Bremen, 2 bls.
A. C. Dodman, Jr., Inc., Olympic, Southampton, 3 bls., 1 cs.
Stone Grass Co., Olympic, Southampton, 1 cs.
R. F. Downing & Co., Olympic, Southampton, 3 cs.

PAPER HANGINGS

A. C. Dodman, Jr., Inc., Laconia, Liverpool, 12 bls., 1 cs.
A. C. Dodman, Jr., Inc., De Grasse, Havre, 8 cs.
W. H. S. Lloyd & Co., Minnewaska, London, 13 bls., 1 cs.
Whiting & Patterson Co., Inc., Olympic, Southampton, 5 cs.
Whiting & Patterson Co., Inc., Mauretania, Southampton, 2 cs.

NEWS PRINT

F. Henjes, Jr., Hamburg, Hamburg, 70 rolls.
Parsons & Whittemore, Inc., Berlin, Bremen, 720 rolls.
Bank of Montreal, Porsanger, Corner Brook, 7,349 rolls.
Stora Kopparberg Corp., Kungsholm, Gothenburg, 78 rolls.
Perkins, Goodwin & Co., Westphalia, Hamburg, 472 rolls.
Hudson Trading Co., Kelkheim, Ortviken, 249 rolls.

PRINTING PAPER

E. Dietzgen & Co., Hamburg, Hamburg, 100 cs.
Keuffel & Esser Co., Hamburg, Hamburg, 44 rolls.
International Forwarding Co., Volendam, Rotterdam, 8 cs.
E. Dietzgen & Co., Volendam, Rotterdam, 4 cs.
P. C. Zuhlke, Arabic, Antwerp, 80 cs.
Japan Paper Co., Olympic, Southampton, 1 cs.

DECALCOMANIA PAPER

C. W. Sellers, Hamburg, Hamburg, 8 cs.
L. A. Consmiller, Hamburg, Hamburg, 20 cs.
C. W. Sellers, Muenchen, Bremen, 2 cs.
B. F. Drakenfeld & Co., Laconia, Liverpool, 41 cs. (duplex).

SURFACE COATED PAPER

Quality Art Novelty Co., Hamburg, Hamburg, 18 cs.
Phoenix Shipping Co., Hamburg, Hamburg, 1 cs.
Gevaert Co. of America, Arabic, Antwerp, 41 cs.

BARYTA COATED PAPER

Globe Shipping Co., Berlin, Bremen, 60 cs.

METAL PAPER

F. C. Gerlach, Hamburg, Hamburg, 1 cs.
Hensel, Bruckman & Lorbacher, Muenchen, Bremen, 47 cs.

FANCY PAPER

Hensel, Bruckman & Lorbacher, Paris, Havre, 2 cs.

PAINTED PAPER

Titan Shipping Co., Paris, Havre, 4 cs.

PACKING PAPER

Atlantic Forwarding Co., Westphalia, Hamburg, 12 cs.

PHOTO PAPER

Globe Shipping Co., Berlin, Bremen, 1 cs.
J. J. Gavin, Mauretania, Southampton, 4 cs.

WRITING PAPER

Japan Paper Co., La Bourdonnais, Havre, 14 cs.
Coenca Morrison Co., La Bourdonnais, Havre, 16 cs.
A. Flinn, Paris, Havre, 1 cs.
Guibout Freres, Paris, Havre, 9 cs.
Weiss Forwarding Co., Paris, Havre, 29 cs.
J. E. Bernard & Co., Olympic, Southampton, 1 cs.
L. Bamberger & Co., Waukegan, Havre, 1 cs.
F. Warde, Westphalia, Hamburg, 1 cs.

FILTER PAPER

Geo. Lueders, La Bourdonnais, Bordeaux, 10 bls.
H. Reeve Angel & Co., Inc., Carmania, London, 8 cs.
H. Reeve Angel & Co., Inc., Olympic, Southampton, 19 cs., 31 bls.

DRAWING PAPER

Keuffel & Esser Co., Hamburg, Hamburg, 45 cs.
H. Reeve Angel & Co., Carmania, London, 5 cs.

TISSUE PAPER

Old Master Paper & Pulp Corp., Hamburg, Hamburg, 59 cs.
B. F. Drakenfeld & Co., Laconia, Liverpool, 1 cs.
Meadows, Wye & Co., Laconia, Liverpool, 1 cs.

COLORED PAPER

S. Langsdorff & Co., Hamburg, Hamburg, 1 cs.
J. Wanamaker, Berlin, Bremen, 13 cs.
E. Henningson & Co., Muenchen, Bremen, 1 cs.
Owen Publishing Co., Muenchen, Bremen, 15 cs.
S. Gilbert, Muenchen, Bremen, 36 cs.
C. W. Williams & Co., Arabic, Antwerp, 11 cs.
J. E. Bernard & Co., Republic, Bremen, 25 cs.

BASIC PAPER

Globe Shipping Co., Berlin, Bremen, 25 cs.

SILK PAPER

Whiting & Patterson Co., Inc., Volendam, Rotterdam, 2 cs.

CARBON PAPER

Hammel & Riglander Co., La Bourdonnais, Havre, 2 cs.

STENCIL PAPER AND INK

Arlac Dry Stencil Co., Hamburg, Hamburg, 50 cs.

MOULD PAPER

Phoenix Shipping Co., Volendam, Rotterdam, 1 cs.

VELLUM PAPER

W. J. Byrnes & Co., Mauretania, Southampton, 5 cs.

MISCELLANEOUS PAPER

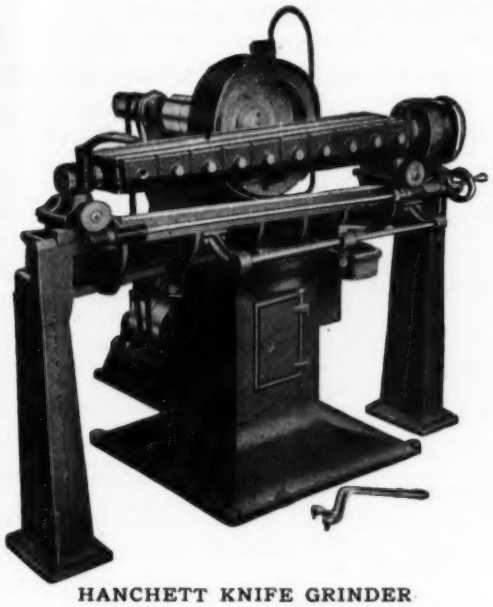
Globe Shipping Co., Volendam, Rotterdam, 67 cs.
Steiner Paper Corp., Volendam, Rotterdam, 18 cs.
I. Beckhard & Co., Volendam, Rotterdam, 9 cs.
Standard Products Corp., La Bourdonnais, Havre, 105 cs.
The Borregaard Co., Inc., Commercial Trader, Gothenburg, 257 bls., 1,485 rolls.
Arkell Safety Bag Co., Commercial Trader, Gothenburg, 165 rolls.
Caepe Kraft Co., Commercial Trader, Gothenburg, 75 rolls.
Wilkinson Bros. & Co., Inc., Muenchen, Bremen, 67 cs.
Standard Products Corp., De Grasse, Havre, 61 cs.
H. Reeve Angel & Co., Inc., Kungsholm, Gothenburg, 37 bls., 103 rolls.
Wilkinson Bros. & Co., Inc., Kungsholm, Gothenburg, 22 bls.
C. K. MacAlpine & Co., Kungsholm, Gothenburg, 42 bls.
Japan Paper Co., Kungsholm, Gothenburg, 7 cs.
E. H. Sargent & Co., Kungsholm, Gothenburg, 10 cs.
Keller Dorian Paper Co., Paris, Havre, 11 cs.
Globe Shipping Co., Paris, Havre, 2 cs.

RAGS, BAGGINGS, ETC.

A. W. Fenton, Inc., Berlin, Bremen, 35 bls. rags.
Overton & Co., Volendam, Rotterdam, 148 bls. rags.
R. F. Downing & Co., Volendam, Rotterdam, 53 bls. bagging.
G. W. Millar & Co., Volendam, Rotterdam, 210 bls. rags.
Katzenstein & Keene, Inc., Volendam, Rotterdam, 107 bls. bagging.
Katzenstein & Keene, Inc., Volendam, Rotterdam, 118 bls. rags.
Chemical National Bank, Hektor, Barcelona, 76 bls. rags.
Chemical National Bank, Hektor, Barcelona, 67 bls. bagging.
The Barrett Co., Hektor, Barcelona, 212 bls. rags.
Harmon & Lichtenstein, Hektor, Barcelona, 181 bls. rags.
E. I. Keller Co., Inc., Hektor, ——, 87 bls. bagging.
W. Schall & Co., Hektor, Valencia, 100 bls. rags.
Bank of The Manhattan Co., Muenchen, Bremen, 96 bls. rags.
Castle & Overton, Inc., Muenchen, Bremen, 211 bls. rags.
Chemical National Bank, Cabo Mayor, Barcelona, 92 bls. rags.
Philadelphia National Bank, Cabo Mayor, Barcelona, 98 bls. rags.
Irving Trust Co., Cabo Mayor, Barcelona, 206 bls. bagging.
Manufacturers Trust Co., Cabo Mayor, Barcelona, 35 bls. rags.
Guaranty Trust Co., Cabo Mayor, Leghorn, 219 bls. rags.
S. Birkenstein & Son, Cabo Mayor, Valencia, 133 bls. rags.
Banco Com'l Italiane Trust Co., Cabo Mayor, Genoa, 65 bls. rags.
A. H. Searle, Inc., Carmania, London, 5 bls. rags.
Jebb Bros., Cameronia, Glasgow, 42 bls. rags.
C. R. Spence & Co., Cameronia, Glasgow, 43 bls. rags.
Anglo South American Trust Co., Cameronia, Glasgow, 57 bls. bagging.
Castle & Overton, Inc., Cameronia, Glasgow, 37 bls. rags.
W. Schall & Co., Anaconda, Rotterdam, 413 bls. bagging.
A. W. Fenton, Inc., Westphalia, Hamburg, 18 bls. rags.
Katzenstein & Keene, Inc., Waukegan, Dunkirk, 65 bls. rags.
Katzenstein & Keene, Inc., Waukegan, Dunkirk, 104 bls. bagging.
International By-Products Co., Waukegan, Dunkirk, 174 bls. flax waste.
D. M. Hicks, Inc., Waukegan, Dunkirk, 80 bls. flax waste.
Castle & Overton, Inc., Waukegan, Dunkirk, 9 bls. rags.
Darmstadt, Scott & Courtney, Waukegan, Dunkirk, 43 bls. rags.
Equitable Trust Co., Waukegan, Havre, 157 bls. rags.
V. Galaup, Waukegan, Havre, 234 bls. rags.
International Purchasing Co., Waukegan, Havre, 103 bls. bagging.
D. I. Murphy, Waukegan, Havre, 72 bls. bagging.
Glasser & Jaffe, Waukegan, Havre, 6 bls. rags.
Dodwell & Co., Waukegan, Havre, 238 bls. bagging.
E. J. Keller Co., Inc., Waukegan, ——, 66 bls. new cuttings.
Castle & Overton, Inc., Albertic, Liverpool, 23 bls. rags.
Castle & Overton, Inc., Albertic, Liverpool, 48 bls. bagging.
Castle & Overton, Inc., Chicago City, Bristol, 119 bls. bagging.
C. B. Richard & Co., Chicago City, Bristol, 181 bls. rags.
Castle & Overton, Inc., Kyno, Antwerp, 160 bls. rags.
Overton & Co., Kyno, Antwerp, 73 bls. rags.
Overton & Co., Kyno, Antwerp, 185 bls. bagging.
D. M. Hicks, Inc., Kyno, Antwerp, 96 bls. thread waste.
W. Schall & Co., Republic, Bremen, 21 bls. paper stock.
Castle & Overton, Inc., Bellflower, Manchester, 76 bls. bagging.
V. Seyen & Co., Bellflower, Manchester, 21 bls. cotton waste.
H. Schimmel, Bellflower, Manchester, 50 bls. cotton waste.
E. J. Keller Co., Inc., Naples Maru, ——, 66 bls. rags.
E. J. Keller Co., Inc., Exermont, ——, 106 bls. rags.
Castle & Overton, Inc., Montanan, San Francisco, 61 bls. rags.

(Continued on page 102)

Production Demands Sharp Knives



HANCHETT KNIFE GRINDER

This Hanchett Knife Grinder is heavy, rigid and fast. Its simplicity and medium price is an important factor to consider when selecting a knife grinder.

ALL HANCHETT PRODUCTS ARE GUARANTEED TO GIVE SATISFACTION

Send us a sample knife to grind.

COVEL-HANCHETT CO.

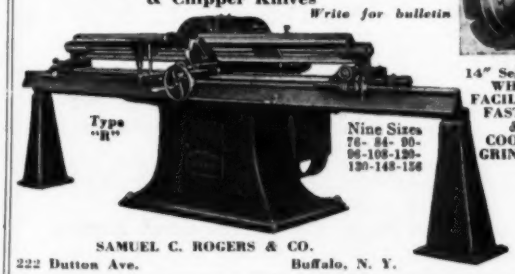
BIG RAPIDS, MICHIGAN, U. S. A.

NEW ROGERS TYPE R

SECTIONAL WHEEL KNIFE GRINDER

Widely used for grinding paper & Chipper Knives

Write for bulletin



14" Segment WHEEL FACILITATES FASTER & COOLER GRINDING

SAMUEL C. ROGERS & CO.

222 Dutton Ave. Buffalo, N. Y.

Your Card in This Space Will Bring Results

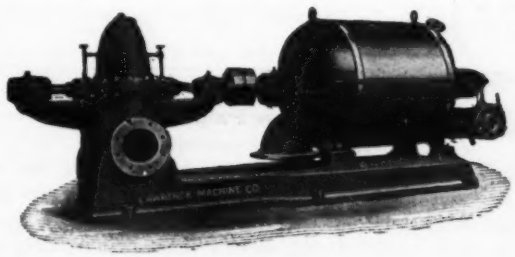
Rates on Application

Horizontally Split Casing Double Suction Pumps

LAWRENCE PUMPS

The name protects and guarantees you satisfaction.

We are the original designers and builders of the LAWRENCE PUMP.



Lawrence pumps for all conditions and services. Forty-four years of practical experience with centrifugal pump development places us among the leaders. Our efforts have been rewarded by the acceptance of our product in general.

Thousands of installations and the successful performance of our pumps should be sufficient proof of our ability to handle your pumping problems. Our engineering force is at your command.

Have only Lawrence Pumps, manufactured by the

Lawrence Machine Company

361 Market St. Lawrence, Mass.

Imports of Paper and Paper Stock

(*Continued from page 100*)

Castle & Overton, Inc., Lalande, S. America, 357 bls. rags.
Castle & Overton, Inc., London Merchant, Scotland, 61 bls. threads.
Castle & Overton, Inc., Alaskan, Japan, 34 bls. rags.
Castle & Overton, Inc., Baltic, Ireland, 72 bls. rags.
Castle & Overton, America, Germany, 25 bls. rags.
Castle & Overton, Inc., Kioto, England, 55 bls. bagging.

OLD ROPE

W. Schall & Co., Hamburg, Hamburg, 38 coils.
Brown Bros. & Co., Hamburg, Hamburg, 37 coils.
Irving Trust Co., Volendam, Rotterdam, 87 coils.
Brown Bros. & Co., Volendam, Rotterdam, 70 bls., 96 coils.
Brown Bros. & Co., De La Salle, Vigo, 81 coils.
French American Banking Corp., Cabo Mayor, Leghorn, 93 coils.
Brown Bros. & Co., Muenchen, Bremen, 73 coils.
F. Stern, Muenchen, Bremen, 72 bales.
Brown Bros. & Co., Minnewaska, London, 62 coils.
Brown Bros. & Co., Westphalia, Hamburg, 33 coils, 22 bales.
N. E. Berzen, Waukegan, Havre, 61 coils.
Brown Bros. & Co., Chicago City, Bristol, 178 coils.
E. Butterworth & Co., Inc., Chicago City, Bristol, 88 coils.
Brown Bros. & Co., Republic, Bremen, 42 coils.

CASEIN

A. Hurst & Co., La Bourdonnais, Havre, 200 bags.
A. Hurst & Co., La Bourdonnais, Bordeaux, 200 bags.
Atterbury Bros., Inc., De Grasse, Havre, 660 bags.
Atterbury Bros., Inc., Paris, Havre, 654 bags.
Kalbfleisch Corp., American Legion, Buenos Aires, 1,900 bags.

WOOD PULP

Polaris Shipping Co., Sonia Maersk, St. Peters, 1,271 cords wood pulp.
J. Andersen & Co., Vulcania, Trieste, 1,050 bls. wood pulp.
A. P. W. Paper Co. (Albany), Nord, Sheet Hasbor, 15,415 bls. wood pulp, 1,661 tons.
Bulkley, Dunton & Co., Volendam, ——, 300 bls. wood pulp.
The Borregaard Co., Inc., Commercial Trader, Hurum, 600 bls. sulphate, 100 tons.
J. Andersen & Co., Commercial Trader, Sarpsborg, 1,752 bls. sulphite, 292 tons.
Kidder Peabody Accep. Corp., Kungsholm, Gothenburg, 217 bls. sulphite.
E. M. Sergeant & Co., Kungsholm, Gothenburg, 449 bls. dry soda pulp.
Castle & Overton, Inc., Anaconda, Rotterdam, 330 bls. wood pulp.
Castle & Overton, Inc., Westphalia, Hamburg, 854 bls. wood pulp, 128 tons.
Pagel, Horton & Co., Inc., Wanja, Gefle, 4,750 bls. wood pulp, 711 tons.
Scandinavian Pulp Agency, Inc., Wanja, Skutskar, 750 bls. wood pulp, 152 tons.
Stora Kopoarberg Corp., Wanja, Skutskar, 1,030 bls. wood pulp, 187 tons.
Johanson, Wales & Sparre, Inc., Kelkheim, Easvik, 300 bls. sulphite.
M. Gottesman & Co., Inc., Kelkheim, Iggesund, 1,625 bls. sulphate.
Bulkley, Dunton & Co., Kelkheim, ——, 1,550 bls. wood pulp.

WOOD PULP BOARDS

Chatham & Phoenix Natl. Bank, Kungsholm, Gothenburg, 19 bls.
Lagerloef Trading Co., Republic, Bremen, 34 bls.

WOOD FLOUR

F. W. Schmalz, Volendam, Rotterdam, 200 bags.

BALTIMORE IMPORTS

WEEK ENDING JUNE 8, 1929

Castle & Overton, Inc., City of Alton, Holland, 110 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING JUNE 8, 1929

Castle & Overton, Inc., City of Alton, Holland, 340 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING JUNE 8, 1929

Brown Bros. & Co., Kyno, Hull, 212 coils old rope.
D. I. Murphy, Kyno, Antwerp, 213 bls. rags.
Cordingley & Co., Kyno, Antwerp, 20 bls. thread waste.
G. Fawcett, Kyno, Antwerp, 84 bls. flax waste.
Spaulding Fibre Co., Kyno, Antwerp, 341 bls. flax waste.
Castle & Overton, Inc., City of Alton, Holland, 510 bls. wood pulp.
Castle & Overton, Inc., Burgerdyk, Holland, 622 bls. wood pulp.
Castle & Overton, Inc., Davisian, England, 13 bls. bagging.

CHARLESTON IMPORTS

WEEK ENDING JUNE 8, 1929

Castle & Overton, Inc., Texan, Japan, 400 bls. bagging.

PHILADELPHIA IMPORTS

WEEK ENDING JUNE 8, 1929

E. J. Keller Co., Inc., Exmouth, ——, 64 bls. rags.
E. J. Keller Co., Inc., City of Alton, ——, 52 bls. rags.
Chase National Bank, Cabo Mayor, Barcelona, 140 bls. rags.
Guaranty Trust Co., Cabo Mayor, Leghorn, 161 bls. rags.
W. J. Jones, Waukegan, Havre, 1 cs. wall paper.
O. G. Hempstead, Waukegan, Havre, 1 cs. wall paper.
Brown Bros. & Co., Waukegan, Havre, 60 bls. new cuttings.
D. I. Murphy, Waukegan, Havre, 622 bls. rags.
Castle & Overton, Inc., Waukegan, Havre, 307 bls. rags.
Katzenstein & Keene, Inc., Waukegan, Havre, 262 bls. rags.
A. Hurst & Co., Waukegan, Havre, 167 bls. rags.
F. Whitaker, Waukegan, Havre, 17 bls. rags.
Delaware Fiber Co., Waukegan, Havre, 143 bls. rags.
Lang Co., Waukegan, Havre, 164 bls. rags.
National Waste Co., Waukegan, Havre, 27 bls. rags.
E. J. Keller Co., Inc., Waukegan, ——, 66 bls. rags.
Katzenstein & Keene, Inc., Waukegan, Dunkirk, 163 bls. rags.
Robert Blank, Waukegan, Dunkirk, 66 bls. rags.
E. Butterworth & Co., Inc., Waukegan, Dunkirk, 305 bls. flax waste.
J. A. Steer & Co., Chicago City, Bristol, 157 bls. old rope.
J. A. Steer & Co., Chicago City, Bristol, 137 bls. waste paper.
Bank of The Manhattan Co., Chicago City, Bristol, 107 bls. rags.
Castle & Overton, Inc., D. Luckenbach, Japan, 167 bls. rags.
Castle & Overton, Inc., Seattle Spirit, Germany, 101 bls. rags.
Castle & Overton, Inc., Yuri Maru, Belgium, 671 bls. rags.
Castle & Overton, Inc., Manchester Shipper, England, 95 bls. rags.
Castle & Overton, Inc., Manchester Shipper, England, 49 bls. bagging.
Castle & Overton, Inc., City of Alton, Holland, 134 bls. rags.
Castle & Overton, Inc., Ulm, Germany, 122 bls. rags.
Castle & Overton, Inc., Etna, Sweden, 300 bls. wood pulp.
Castle & Overton, Inc., Amasis, Germany, 4,317 bls. wood pulp.
Castle & Overton, Inc., Ambridge, Belgium, 245 bls. rags.

May Build New Pulp Terminal

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., June 10, 1929.—Announcement was made here this week that the sale of 1,200 feet of water frontage in the St. Lawrence River just east of Morristown to Watertown and Dexter paper manufacturing interests had been virtually completed. The waterfront property is owned by the Winter Park Boys' Club of this city and it is understood that it will be used as a pulp terminal by the Dexter paper company. It is a valuable piece of property being ideally located on the New York Central Railroad near the main channel. Although not mentioned in connection with the sale Frank A. Augsbury, head of the Algonquin Paper Company, is reported to have interested the Dexter and Watertown mill men in the site and the former owners have stated that it was largely through his auspices that this section will soon have a new industry. It was learned that the local owners of the property under the terms of the sale retain about 3,200 feet of land adjoining the state highway.

Sutherland Paper Co. Makes Good Report

KALAMAZOO, Mich., June 10, 1929.—The Sutherland Paper Company's gross profit on sales for 1928 were $690,234.16, according to a report completed by Haskins & Sells, auditors. Selling and administrative expenses are placed at $320,556.43, other charges less other income, $2,372.04; Federal income tax, $45,102.08; net profit, $322,203.81.

For the year ending December 31, 1928, the current assets to current liabilities were $1,483,615.60 to $347,430.59, or better than 4¼ for 1. There is a total surplus of $1,023,817.34. On the basis of 300,000 shares of common stock outstanding, the book value per share exceeds $12.90 a share.

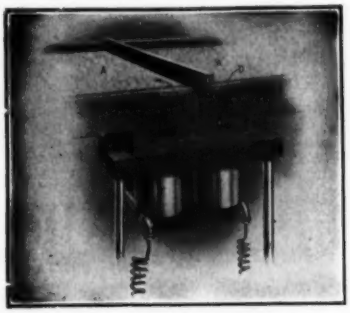
Fire Damages Zellerbach Warehouse

SPOKANE, Wash., June 6, 1929.—Fire swept through the fourth floor of the warehouse of the Zellerbach Paper Company here, June 4, doing damage estimated at between $150,000 and $200,000.

Huge stocks of paper were consumed, the crepe paper stored in this section proving particularly hard to control when burning.

INSULATING PAPERS

Are you making paper for insulating purposes? If so, our *Type B Iron Extractors* are a necessary part of your equipment.



Hundreds of these extractors are in use in the United States, Canada, and Europe. Write us for Bulletins and full data.

THE ROLAND T. OAKES CO.

Electrical Specialists **Holyoke, Mass.** *Established 1885*

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers.

also

Bleached Spruce Sulphite and Soda, Kraft Pulp

230 Park Ave. New York — 35 East Wacker Drive Chicago

508 Market St., San Francisco, Cal.

Sixth and Chestnut Sts., Philadelphia, Pa.

CLEAN FELTS mean LOWER COSTS

Consider what it means to have your felts continuously clean and soft. The felts absorb more water, enabling you to maintain pressure on the press rolls. This, in turn, relieves the dryers, to a large extent, and has the effect of increasing dryer capacity. An increase in dryer capacity permits you to run the machine faster, achieving the much desired increase in production.

Furthermore, by keeping your felts clean, you are able to maintain maximum speed throughout the week.

The SCOFIELD FELT CONDITIONER installed on your paper machine increases production and lowers costs by eliminating shutdowns for washing or the roping of felts.

The SCOFIELD FELT CONDITIONER is designed for application to any felt and for use on machines making all grades of paper—from finest tissues to boxboard.

Many mills are using this method of felt conditioning. Why not get in line and secure the same remarkable results they are getting?

We will gladly furnish full particulars.

GILBERT J. SCOFIELD COMPANY, INC.

408 No. Pearl St.

ALBANY, N. Y.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, June 12, 1929.

Trading in the local paper market was moderately active during the past week. With the approach of the mid-summer vacation period both production and consumption are falling off slightly. Sales frces of the leading paper organizations, however, are still pursuing a strenuous campaign for orders and no determined slump is anticipated for some weeks to come. Prices are holding to former levels, in most instances, and there is little talk of concessions around at present.

The news print market is showing signs of improvement. Demand from the publishers is well up to average for the time of year. Production is being maintained at approximately 85 per cent of capacity in the United States and Canada, while shipments are averaging around 86 per cent of rating. Stocks in hand at the mills are not excessive. Prices are holding to schedule.

No radical changes were recorded in the paper board market. Supplies are being offered in sufficient volume to meet current requirements. The price situation continues unsatisfactory. Demand for the various grades of fine paper is excellent and prices rule steady. Tissues are moving in fair volume for the season. The kraft paper market is rather quiet. Wrapping paper is moving in a normal manner for the time of year.

Mechanical Pulp

Steadiness prevails in the ground wood market. Both imported and domestic mechanical pulp are going forward into consumption in satisfactory volume. While there is no undue accumulation of stocks, offerings are about sufficient to cope with current needs. Prices remain unchanged from the levels quoted for some time past.

Chemical Pulp

The chemical pulp market is in a sound position. Both foreign and domestic producers are well sold ahead on contract. The spot demand, however, has quietened down somewhat, due mainly to the arrival of open water shipments from the Baltic. It is interesting to note that Norwegian pulp mills are rebuilding their equipment to enable them to turn out pulp for rayon manufacture, instead of unbleached pulp for paper mill consumption. Based on reports made public from the first of the year, no less than 75,000 tons should be diverted from unbleached to bleached pulp production during 1929.

Old Rope and Bagging

Demand for old rope is stronger than for some time past and the market is exhibiting a firm undertone. Dealers are now asking from $4.60 to $4.85 for foreign manila rope and from $5.00 to $5.25 for domestic manila rope. Mixed strings are moving in fair volume. The bagging market is practically unchanged. Roofing bagging is in moderate request, while gunny bagging is fairly steady. Prices remain unaltered.

Rags

Most of the business transacted in the domestic rag market during the past week was along routine lines. Demand for cotton rags was fairly persistent. Roofing grades are in steady request. Mixed rags are moving in satisfactory volume. Some interest in imported rags appears to be developing, although there is not much change in the situation abroad, where the demand for home consumption is heavy.

Waste Paper

The paper stock market was fairly active during the past week. Paper board mild demand for the lower grades was well up to average and prices ruled steady and unchanged. Old kraft machine compressed bales are arousing more interest. Soft white shavings continue to move in satisfactory volume. Book stock was rather quiet. Prices on the various grades of waste paper are practically unchanged.

Chemipulp Process Opens Office in Watertown

WATERTOWN, N. Y., June 10, 1929.—Chemipulp Process, Inc., which has just announced the opening of an office at 450 Woolworth Building here is prepared to offer to the chemical manufacturers a unique service in that its organization consists of highly specialized men who are trained in putting into operation special chemical processes which they control as well as make operating surveys and careful estimates covering reduction in manufacturing costs.

The following plants are now successfully operating Chemipulp processes: Algonquin Paper Company, Ogdensburg, N. Y.; Anglo-Canadian Pulp and Paper Company, Limoilou, Que.; Nekoosa-Edwards Paper Company, Port Edward, Wis.; Hobert Paper and Fibre Company, Green Bay, Wis.; and St. Lawrence Paper Mills, Three Rivers, Que.

In addition to the above plants which are now operating the Chemipulp processes, contracts have beeen closed for the installation of these processes in the plants of the Abitibi Power and Paper Company and the Restigouche Company's Ltd. new bleached pulp mill at Atholl, New Brunswick.

F. W. Leadbetter Acquires Tumwater Mills

PORTLAND, Ore., June 7, 1929.—F. W. Leadbetter, Portland, during the last week in May acquired control of the Tumwater Paper Mills Company, operating mills on Tumwater Bay, near Olympia, Wn. The properties include the mill site approximating 36 acres with a modern paper manufacturing plant completed in 1928.

Mr. Leadbetter who already has an extensive listing of paper plant properties, acquired this new unit for the manufacture of finished paper products.

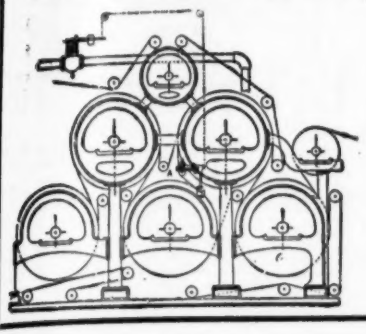
Co-incident with this announcement is the announcement of the industrial financing program of Richards & Blum, Inc., of Spokane, and Joseph C. Tyler & Co. of San Francisco, investment bankers, offering $400,000 7 per cent sinking fund bonds of the Tumwater Paper Mills Company. The fixed assets securing this issue have been appraised at $1,087,000.

American Writing Directors Meet

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., June 11, 1929.—The monthly meeting of the directors of the American Writing Paper Company, Inc., was held last week at the company's offices in this city. Previous to the business meeting the directors were taken on a tour of the mills to inspect the work of rehabilitation which is now nearly completed, the installation of a new water wheel in the Albion Division and the building of a spur track from Race street to the Beebe & Holbrook Division being the principal work yet unfinished.

The Pickles Drying Regulator



WE ARE SAFE IN OUR PROPOSITION

YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES **Buckland, Conn.**

The B QUALITY PULPS

HAFSLUND NORWAY

"HAFSLUND BEAR"
Bleached Sulphite

F:HAGA

"FORSHAGA"
Bleached Sulphite

KRAFT HURUM NORWAY SPECIAL

"HURUM SPECIAL"
Extra Strong Kraft

KOOS BAC

"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

EASTWOOD
FOURDRINIER-CYLINDER-WASHER
WIRES

EASTWOOD WIRE CORPORATION, BELLEVILLE N.J. U.S.A.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, June 12, 1929.

BLANC FIXE.—Business in the blanc fixe market was fairly active during the past week. Contract shipments were well up to average. The pulp is still quoted at from $42.50 to $45.00 per ton, in bulk, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Supplies of bleaching powder are going forward to the paper mills in satisfactory volume. Inquiries for future business are fairly numerous. Prices are generally holding to schedule. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in large drums, at works.

CASEIN.—The casein market is practically unchanged. Domestic casein is still quoted at from 16 cents to 17 cents per pound, while standard ground imported is selling at from 15½ cents to 16 cents per pound, and finely ground at from 16½ cents to 17 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is persistent. Contract shipments are moving at an excellent pace. Prices remain unaltered. Solid caustic soda is quoted at from $2.90 to $2.95, while flake and the ground are selling at from $3.30 to $3.35 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is in a sound position. Supplies are moving into consumption regularly. Prices remain steady and unchanged. Imported china clay is quoted at from $15 to $25 per ton, ship side, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. Shipments against contracts are well up to average for the season. Chlorine is quoted at 3 cents per pound, in tanks, or multi-unit cars, at works, on standard contracts. The spot quotation ranges from 3¾ cents to 3½ cents per pound.

ROSIN.—No radical changes were recorded in the rosin market. The grades of gum rosin used in the paper mills are now quoted at from $8.20 to $8.35 per 280 pounds, in barrels, ex dock. Wood rosin is selling at from $6.50 to $7.30 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—The salt cake market is exhibiting a strong undertone. Supplies are moving into consumption in good volume. Offerings are limited and prices firm. Salt cake is quoted at from $16 to $18 per ton, while chrome salt cake is selling at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—Production of soda ash is being maintained in sufficient volume to take care of current requirements. Shipments are proceeding in a satisfactory manner. Contract quotations on soda ash, in car lots, at work, per 100 pounds, are as follows: in bags, $1.32½; and in barrels, $1.55.

STARCH.—The starch market was moderately active during the past week. Contract shipments are moving in a normal manner for the season. Prices are generally holding to previously recorded levels. Special paper making starch is quoted at $3.82 per 100 pounds, in bags, and at $3.99, in barrels.

SULPHATE OF ALUMINA.—Trading in the sulphate of alumina market was fairly active. Supplies continue to move to the paper mills in good volume. Prices remain unchanged. Commercial grades are quoted at from $1.40 to $1.55 and iron free at from $1.95 to $2.05 per 100 pounds, in bags, at works.

SULPHUR.—The position of the sulphur market is practically unchanged. Prices are steady to firm. Sulphur is quoted at $18 per ton, in lots of 1,000 tons, on yearly contracts, and at $20 per ton for any smaller quantity over that period. On spot and nearby car loads, the quotation is $21 per ton.

TALC.—Conditions in the talc market are satisfactory for the season. Demand for this product is fairly persistent. Prices generally remain unaltered. Domestic talc is quoted at from $16 to $18 per ton, at eastern mines, while imported talc is still selling at from $18 to $20 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@53.25
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	8.00	@11.00
Book, Cased—		
S. & S. C.	6.00	@ 7.50
M. F.	5.75	@ 7.00
Coated and Enamel	7.50	@12.00
Lithograph	7.50	@12.00
Tissues—Per Ream—		
White No. 1	.75	@ 1.00
Anti-Tarnish	1.35	@ 1.90
Colored	1.00	@ 2.00
White No. 2	.75	@ .80
Kraft	1.00	@ 1.10
Manila	.75	@ .80
Kraft—		
No. 1 Domestic	6.25	@ 6.50
No. 2 Domestic	5.25	@ 5.50
Southern	4.25	@ 4.50
Imported	6.50	@ 7.00
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.75	@ 5.25
No. 2 Wood	4.00	@ 4.50
Butchers	3.75	@ 4.25
Fibre Papers—		
No. 1 Fibre	5.00	@ 5.50
No. 2 Fibre	4.75	@ 5.25
Common Bogus	2.75	@ 3.00
Screenings	3.00	@ 3.25
Card Middles	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

(Delivered New York)

News, per ton—		
Rolls, contract	62.00	@ —
Rolls, spot	62.00	@ —
Sheets	67.00	@ —
Side Runs	47.00	@52.00
Boards—per ton—		
News	32.50	@37.50
Straw	52.50	@55.00
Chip	30.00	@35.00
Binders' Boards	65.00	@70.00
Sgl. Mla. Ll. Chip.	42.50	@45.00
Wood Pulp	80.00	@85.00
65 Test Jute Liner.	52.50	@ —
85 Test Jute Liner.	55.00	@ —

Mechanical Pulp

(Ex-Dock)

No. 1 Imported—		
Moist	28.00	@31.25
Dry	32.00	@34.00

(F. o. b. Mill)

No. 1 Domestic	26.00	@29.00
Screenings	15.00	@20.00

Chemical Pulp

(Ex-Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.75	@ 4.40
Easy Bleaching	2.90	@ 3.10
No. 1 strong unbleached	2.60	@ 2.80
Mitscherlich unbleached	2.60	@ 3.25
No. 2 strong unbleached	2.40	@ 2.50
No. 1 Kraft	2.40	@ 2.75
No. 2 Kraft	2.35	@ 2.50
Sulphate—		
Bleached	3.60	@ 3.85

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	3.40	@ 4.75
Easy Bleaching Sulphite	2.60	@ 2.75
News Sulphite	2.40	@ 2.50
Mitscherlich	3.00	@ 3.25
Kraft (Domestic)	2.50	@ 3.30
Soda Bleached	3.10	@ 3.25
Sulphate Screenings—		
Coarse	.75	@ .95
Refined	1.65	@ 1.85

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1.	11.00	@11.50
New White, No. 2.	8.00	@ 8.50
Silesias No. 1	7.50	@ 8.00
New Unbleached	11.00	@11.50
New Blue Prints	5.25	@ 5.50
New Soft Blacks	5.25	@ 5.75
Washables	4.75	@ 5.25
Fancy	5.75	@ 6.25
Mixed Khaki Cuttings	4.75	@ 5.25
Fink Corset Cuttings	8.00	@ 8.50
O. D. Khaki Cuttings	5.15	@ 5.75
Men's Corduroy	3.75	@ 4.25
New Mixed Blacks	3.50	@ 3.75

Old Rags

White, No. 1—		
Repacked	5.50	@ 6.00
Miscellaneous	4.50	@ 5.00
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.50	@ 2.75
St. Soiled, White	2.00	@ 2.15
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.75	@ 2.00
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.70	@ 1.80
No. 1	1.70	@ 1.80
No. 2	1.55	@ 1.65
No. 3	1.30	@ 1.40
No. 4	1.25	@ 1.35
No. 5A	.90	@ 1.05

Foreign Rags

New Rags

New Dark Cuttings.	2.50	@ 3.00
New Mixed Cuttings	2.75	@ 3.25
New Light Silesias	7.00	@ 7.50
Light Flannelettes	7.50	@ 8.00
Unbleached Cuttings.	10.00	@11.00
New White Cuttings.	10.50	@11.50
New Light Oxfords	7.00	@ 7.50
New Light Prints	5.50	@ 6.50

Old Rags

No. 1 White Linens.	7.50	@ 8.25
No. 2 White Linens.	5.75	@ 6.75
No. 3 White Linens.	4.75	@ 5.25
No. 4 White Linens.	3.00	@ 3.50
No. 1 White Cotton.	5.50	@ 6.50
No. 2 White Cotton.	4.50	@ 5.50
No. 3 White Cotton.	3.00	@ 4.00
No. 4 White Cotton.	1.90	@ 2.15
Extra Light Prints	2.75	@ 3.25
Ord. Light Prints	2.25	@ 2.50
Med. Light Prints.	2.00	@ 2.10
Dutch Blue Cottons	2.25	@ 2.40
French Blue Linens	2.75	@ 2.85
German Blue Linens.	2.35	@ 2.55
German Blue Cottons	2.15	@ 2.25
Checks and Blues	1.85	@ 2.00
Lindsay Garments	1.85	@ 1.95
Dark Cottons	1.60	@ 1.65
Old Shopperies	1.55	@ 1.60
New Shopperies	1.50	@ 1.60
French Blues	2.10	@ 2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.60	@ 1.70
Domestic	1.70	@ 1.75
Wool Tares, light	1.60	@ 1.65
Wool Tares, Heavy	1.60	@ 1.70
Bright Bagging	1.60	@ 1.70
Small Mixed Rope	1.25	@ 1.40
Manila Rope—		
Foreign	4.60	@ 4.85
Domestic	5.00	@ 5.25
New Burlap Cut	2.75	@ 3.00
Hessian Jute Threads—		
Foreign	3.50	@ 4.00
Domestic	3.25	@ 3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	3.25	@ 3.50
Hard, white, No. 2	2.40	@ 2.55
Soft, White, No. 1.	2.50	@ 2.60
White envelope cuttings	3.00	@ 3.50
Flat Stock—		
Stitchless	1.60	@ 1.70
Overissue Mag.	1.60	@ 1.70
Solid Flat Book	1.50	@ 1.60
Crumpled No. 1	1.10	@ 1.20
Solid Book Ledger	2.00	@ 2.10
Ledger Stock	1.70	@ 1.80
New B. B. Chips	.65	@ .75
Manilas—		
New Env. Cut	2.40	@ 2.60
New Cuttings	1.60	@ 1.85
Extra No. 1 old	1.25	@ 1.35
Print	.75	@ .80
Container	.55	@ .65
Bogus Wrapper	.75	@ .85
Old Kraft Machine		
Compressed bales	1.85	@ 1.95
News—		
No. 1 White News	1.65	@ 1.75
Blue Overall	7.50	@ 8.00
Strictly Overissue	.75	@ .80
Strictly Folded	.57½	@ .62½
No. 1 Mixed Paper	.42½	@ .47½
Common Paper	.30	@ .34

SKANEATELES FALLS, N.Y.

NEW YORK STATE

The Place Where GOOD FELTS Come From

PRESS FELTS
for BOARD MACHINES
that give SATISFACTION

THE WATERBURY FELT CO.

SKANEATELES FALLS, N.Y.

WOODPULP AGENTS

PRICE & PIERCE, Ltd.,

17 EAST 42ND ST.

NEW YORK

CLAY

EDGAR

400 Tons Daily

American made for American Trade

H. T. BRAND
COATING CLAY
and
High Grade Filler Clay

Edgar Clays are the result of almost half a century of experience in washing Clay. Technical service available for both coating and loading without charge.

Ask for Samples

EDGAR BROS. CO.
50 CHURCH ST. NEW YORK

SHLICK PATENT

BEATER ROLLS

AT ONCE INCREASE

CIRCULATION AND OUTPUT } 30-50%

MANY REPEAT ORDERS

Leo Shlick Engineering Co.

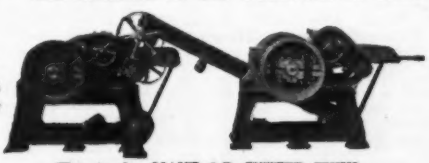
314 Beacon St. Boston, Mass.

RAGS—BURLAP—BAGGING—ROPE

JUTE BUTTS, MAGAZINES, CATALOGS, OLD PAPERS, THREAD WASTE AND ALL GRADE OF RAGS CUT QUICKLY AND EFFICIENTLY WITH THE

GIANT The Standard of the World for 59 Years

Giant Rag Cutters have capacities of from 1 to 5 tons per hour



This is the GIANT 3-B CUTTER WITH A CAPACITY OF 3000 lbs. PER HOUR

TAYLOR, STILES & COMPANY, Riegelsville, N. J., U. S. A.

CANADIAN REPRESENTATIVES
Waterous, Limited
Brantford, Ont., Canada

R. J. MARX
SOLE AGENTS FOR EUROPE
133-39 Finsbury Pavement, London, E. C.

Twines
(F. o. b. Mill)

Cotton—			
No. 1	.39	@	.40
No. 2	.37	@	.38
No. 3	.36	@	.37
B. C., 18 basis	.38	@	.40
A. B. Italian, 18 basis	.48	@	.53
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrapping, 3-6 Ply—			
No. 1	.19	@	.21
No. 2	.18	@	.20
Tube Rope—			
4-ply and larger	.16	@	.17
Fine Tube Yarn—			
5-ply and larger	.21	@	.25
4-ply	.25	@	.29
3-ply	.28	@	.32
Unfinished India—			
Basis	.13	@	.14
Paper Makers Twine			
Balls	.11	@	.12
Box Twine, 2-3 ply	.15	@	.17
Jute Rope	.17	@	.19
Amer. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.16	@	.18
No. 2 Basis	.14	@	.16
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Rope	.22	@	.24

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine writing	.18	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¾
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	.06¼	@	.06½
Southern Kraft	.03¾	@	.04
No. 2 Kraft	.04	@	.04¼
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue—			
24x36 Sheet	.07	@	.07½
White Tissue—			
20x30 Sheet	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	62.00	@	—
Sheets	67.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	42.50
Solid News	47.50	@	—
Solid News	40.00	@	45.00
Manila Lined Chip	50.00	@	55.00
Container Lined—			
85 Test	65.00	@	70.00
100 Test	70.00	@	—

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.20	@	2.25
White Env. Cuttings	2.40	@	2.50
No. 1 Soft Shavings	2.00	@	2.10
No. 1 Mixed	.90	@	1.00
No. 2 Mixed	.70	@	.75
Ledger & Writings	1.25	@	1.35
Solid Books	1.25	@	1.30
Blanks	1.40	@	1.50
Krafts	1.60	@	1.75
New Kraft Cuts	2.15	@	2.25
Manila Envelope Cuttings	1.65	@	1.75
Ex. No. 1 Manila	1.30	@	1.45
Print Manila	.75	@	.80
Folded News (over-issue)	.80	@	.85
Old Newspapers—			
No. 1	.65	@	.70
No. 2	.60	@	.65
Mixed Papers—			
No. 1	.60	@	.65
Roofing Stocks—			
(F. o. b. Chicago, net cash)			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.06	@	.40
Ledgers	.09	@	.40
Writings—			
Superfine	.12½	@	.18
Extra fine	.18	@	.22
Fine	.17	@	.26
Fine, No. 2	.15	@	.25
Fine, No. 3	.10	@	.20
Book, M. F.	.05½	@	.07
Book, S. & C.	.06	@	.07½
Book, Coated	.09½	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.08	@	.09
Manila Sul., No. 1	.04	@	.05½
Manila No. 2	.03	@	.04
No. 2 Kraft	.06	@	.06½
No. 1 Kraft	.06½	@	.07
Common Bogus	.03½	@	.04
(Delivered Philadelphia)			
News Print Rolls	62.00	@	—
Straw Board	52.50	@	75.00
News Board	35.00	@	40.00
Chip Board	32.00	@	40.00
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00		
No. 2, per ton	70.00		
Carload lots	68.00	@	70.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.10½	@	.11
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.07	@	.09
Black Silesia, soft	.05	@	.05½
New Unbleached	.10½	@	.11
Washable, No. 1	.04½	@	.05
Blue Overall	.07½	@	.08
Cottons—According to grades—			
Washable, No. 2	.03	@	—
New Blue	.03	@	.03½
Fancy	.05½	@	.06
New Black Soft	.05	@	.05¾
New Light Seconds	.02½	@	.03
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05½	@	.05¾
No. 2 Mixed	.04½	@	.04¾
Corduroy	.03	@	.03¾
New Canvas	.08½	@	.09
New Black Mixed	.03¾	@	.04½

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	3.50	@	4.00
Sisal Rope	1.50	@	—
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	3.20	@	3.25
No. 2 Hard White	2.75	@	3.00
No. 1 Soft White	2.80	@	2.90
No. 2 Soft White	1.80	@	1.90
No. 1 Mixed	1.50	@	1.60
No. 2 Mixed	.90	@	1.00
Solid Ledger Stock	1.85	@	1.90
Writing Paper	1.60	@	1.65
No. 1 Books, heavy	1.40	@	1.50
No. 2 Books, light	1.05	@	1.15
No. 1 New Manila	2.40	@	2.50
No. 1 Old Manila	1.50	@	1.60
Print Manila	.95	@	1.00
Container Manila	.85	@	.90
Old Kraft	2.25	@	2.50
Common paper	.50	@	.55
No. 1 Mixed Paper	.65	@	.70
Straw Board, Chip	.65	@	.70
Binders Board, Chip	.65	@	.70
Overissue News	.85	@	.90
Old Newspaper	.50	@	.55

Domestic Rags (Old)

White, No. 1—			
Repacked	4.25	@	4.50
Miscellaneous	3.50	@	3.75
White, No. 2	2.00	@	2.25
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.60	@	1.80
Black Stockings (Export)	3.90	@	4.25
Roofing Stock—			
Foreign No. 1	1.65	@	1.75
Repacked	.02½	@	.03¾
No. 2	1.30	@	1.35
No. 3 (Roofing)	1.15	@	1.25
No. 4	1.00	@	1.15
No. 5A	.75	@	.85
B	.65	@	.75
C	.65	@	.70

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.15
Rag content	.15	@	.30
All rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.07	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05¼	@	.08½
Book, Coated	.08½	@	.20
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.06¼	@	.06½
No. 2 Kraft	.04½	@	.05½
Common Bogus	.02	@	.02¾
Delivered New England points			
News Print Rolls	61.50	@	—
Straw Boards, rolls .009			52.50
Straw Board in Sheets, basis 35s to 70s	54.50	@	55.00
Filled News Board	37.50	@	40.00
Chip Board	35.00	@	37.50
Single Manila Lined Chip	47.50	@	50.00
Single White, Patent Coated Newsboard			
Bender	65.00	@	80.00
Wood Pulp Board	80.00	@	85.00
Binder Boards	70.00	@	75.00
(F. o. b. Mill)			
Tarred Felts—			
Regular, carload lots	65.00	@	—

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	2.40	@	2.50
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	2.35	@	2.45
No. 1 Books, Heavy	1.50	@	1.55
No. 1 Books, Light	—	@	1.15
Manila Env. Cuttings	2.00	@	2.25
No. 1 Old Manila	.90	@	1.00
White Blank News	1.50	@	1.60
Old Kraft	1.75	@	1.80
Print Manila	.80	@	.90
No. 1 Mixed Paper	.40	@	.45
Overissue News	.65	@	.70
Old Newspapers	.50	@	.52½
Box Board, Chip	.55	@	.60

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.50
Manila Rope—			
Foreign	4.75	@	5.12½
Domestic	5.25	@	5.50
Mixed Strings	.90	@	1.00
Jute Wool Strings	—	@	1.00
Scrap Burlaps	1.37½	@	1.50
Scrap Sisal	1.87½	@	2.00
Scrap Sisal for shredding	1.85	@	2.00
Wool Tares, heavy	1.60	@	—
New Burlap Cutting	1.90	@	2.00
Australian Wool Pouches	3.00	@	3.12½

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.09½	@	.10
Silesias, No. 1	.06	@	.06¾
New Unbleached	.10	@	.10½
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06¼	@	.06¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.04	@	.04¾
O. D. Khaki	.05	@	—
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.75	@	3.00
Thirds and Blues—			
Repacked	2.50	@	—
Miscellaneous	1.75	@	1.90
Black Stockings	—	@	4.00
Roofing Stock—			
No. 1	1.65	@	1.75
No. 2	1.45	@	1.55
No. 3	1.05	@	1.10
No. 4	1.10	@	1.15

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.55	@	1.60
New No. 1 Shirt Cuttings	9.00	@	10.00
Dutch Blues	2.00	@	2.12½
Lace Curtains	4.75	@	5.00
New Checks & Blues	4.25	@	4.50
Old Fustians	1.90	@	—
Old Linsey Garments	1.85	@	1.90

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¼	@	—
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	7.50	@	—
No. 2 M. F. (carloads)	7.25	@	—
No. 3 M. F. (carloads)	7.00	@	—
No. 1 S. C. (carloads)	8.00	@	—
No. 2 S. C. (carloads)	7.75	@	—
No. 3 S. C. (carloads)	7.50	@	—
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	11.50	@	—
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.80	@	—
No. 1 Manila	6.65	@	—
Fiber	6.65	@	—
Kraft, M. F.	7.00	@	—
M. G.	7.00	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	61.50	@	62.00
Sheets	67.00	@	—

Pulp
(F. o. b. Mill)

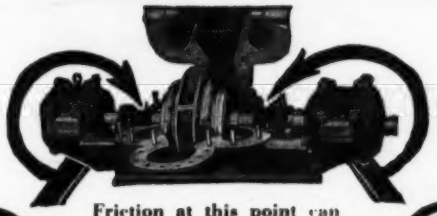
Ground Wood	30.00	@	31.00
Sulphite easy bleaching	60.00	@	—
Sulphite news grade	60.00	@	—
Sulphite, bleached	77.00	@	—
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.00	@	—
Soft White Book Shavings	2.85	@	—
White Blk. News	1.60	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.40	@	—
Light and Crumpled Book Stock	1.25	@	—
Ledgers and Writings	1.50	@	—
Solid Ledgers	1.50	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.85	@	—
Strictly Folded	.85	@	—
No. 1 Mixed Paper	.65	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.10	@	.10½
Fancy Shirt Cuttings	.05½	@	—



Friction at this point can be very expensive.

Solutions of Caustic Soda and similar chemicals will wash out the lubricant from ordinary packings that harden and cut the shaft.

CUTNO PACKING

carries in each separate strand a lubricant that successfully resists the cutting action of Caustic Soda and all alkali solutions.

To prevent the destruction of shaft friction use "Cutno" packing, that not only has an abundance of lubricant to overcome the usual shaft friction, but also resists the washing out tendency of the chemical solutions with which it comes in contact.

Let us send you a working sample to test out under your own conditions. State size of packing desired for test.

GREENE, TWEED & CO
Sole Manufacturers
109 Duane St. New York

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

FIFTY-SEVENTH YEAR

Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President — J. BANNINGA, Secretary

Executive and Editorial Offices: 10 East 39th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1929, by the Lockwood Trade Journal Co., Inc.

Paper Tariff Before Finance Committee 27
Pennsylvania Mills Are Less Active 30
Worthy Paper Co. Exhibits 30
Shryock Bros. Add Mill Machinery 30
Paper Production Increase in April 31
Old Tidewater Paper Mills Equipment Sold 31
Ontario Manufacturers Continue Active 32
News Print Conditions Satisfactory 32
Organize Industry to Make Use of Straw 33
Paper Demand Falls Off Slightly in Chicago 34
News of the Boston Paper Trade 34
Unity Paper Co.'s Wage Agreement 34
Safety Conference Well Attended 35
Carton Club of Boston Has Outing 35
International Plans British Columbia Mill 36
Vocational Training at Middletown 36
Boston Paper Trade's Annual Meeting 38
Canadian Farmers Urge Straw for Paper 40
Boston Paper Market Fairly Active 40
Construction News 42
Forestry at the University of Idaho 46
Pacific Mills Make Good Report 46
Paper Mill Employment Increases 46
New York Trade Jottings 48
Power Plant Section 50
Large Awards for Paper Mill Workers 56
Editorial 58
Moose River Plant Damaged by Fire 59
Wax Trade Practice Conference Held 59
Technical Section
Insulating Board from Cornstalk 61
Current Paper Trade Literature 62
Recent Activities of the Paper Research Laboratory of the Bureau of Standards 65
Scientific Control in a Ground Wood Mill 70
Cost Section 71
Imports of Paper and Paper Stock 78
New York Market Review 82
Miscellaneous Markets 84
Market Quotations 86

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 87, 88, 89, 90

PARSONS & WHITTEMORE

INCORPORATED

10 EAST 40th ST., NEW YORK

WOOD PULP PAPER

SOLE SELLING AGENTS

ASPA

PRIME SWEDISH KRAFT PULP

"E S" FOR BOARD, BAG and HEAVY WRAPPING PAPER

"S" FOR LIGHT WEIGHT PAPER and M. G. KRAFT

SHIPMENT ENTIRE YEAR

TONNAGE AVAILABLE PROMPT SHIPMENT FROM DOCK

INQUIRIES CONTRACTS SOLICITED 1929-1930

KALAMAZOO REPRESENTATIVE—

ALEXANDER W. MACVIE

1414 PORTAGE ST.

KALAMAZOO, MICH.